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Final

Report 11658
March 2000

AEROJET

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)

Performance Verification Report

Final Comprehensive Performance Test Report

P/N 1331200-2-TST, S/N 108/A2

Contract No. NAS 5-32314
CDRL 208

Submitted to:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Submitted by:

Aerojet
1100 West Hollyvale Street
Azusa, California 91702

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CAGE/Facility Ident: 70143

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2 Apr 1999

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20 Jan 99

PROCESS SPECIFICATION

METSAT/KLM/AMSU-A2, SYSTEM COMPREHENSIVE AND LIMITED PERFORMANCE TESTS TEST PROCEDURE

Contract No.: NAS5-32314

Prepared for:

NASA/Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

TABLE OF CONTENTS

FIGURES

TABLES

TEST DATA SHEETS

TEST DATA SHEETS (CONT)

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1. SCOPE

1.1 ***Scope.*** This specification establishes the requirements for the Comprehensive Performance Test (CPT) and Limited Performance Test (LPT) of the Advanced Microwave Sounding Unit-A2 (AMSU-A2), referred to herein as the unit. The unit is defined on Drawing 1331200.

1.2 ***Test procedure sequence.*** The sequence in which the several phases of this test procedure shall take place is shown in Figure 1, but the sequence can be in any order.

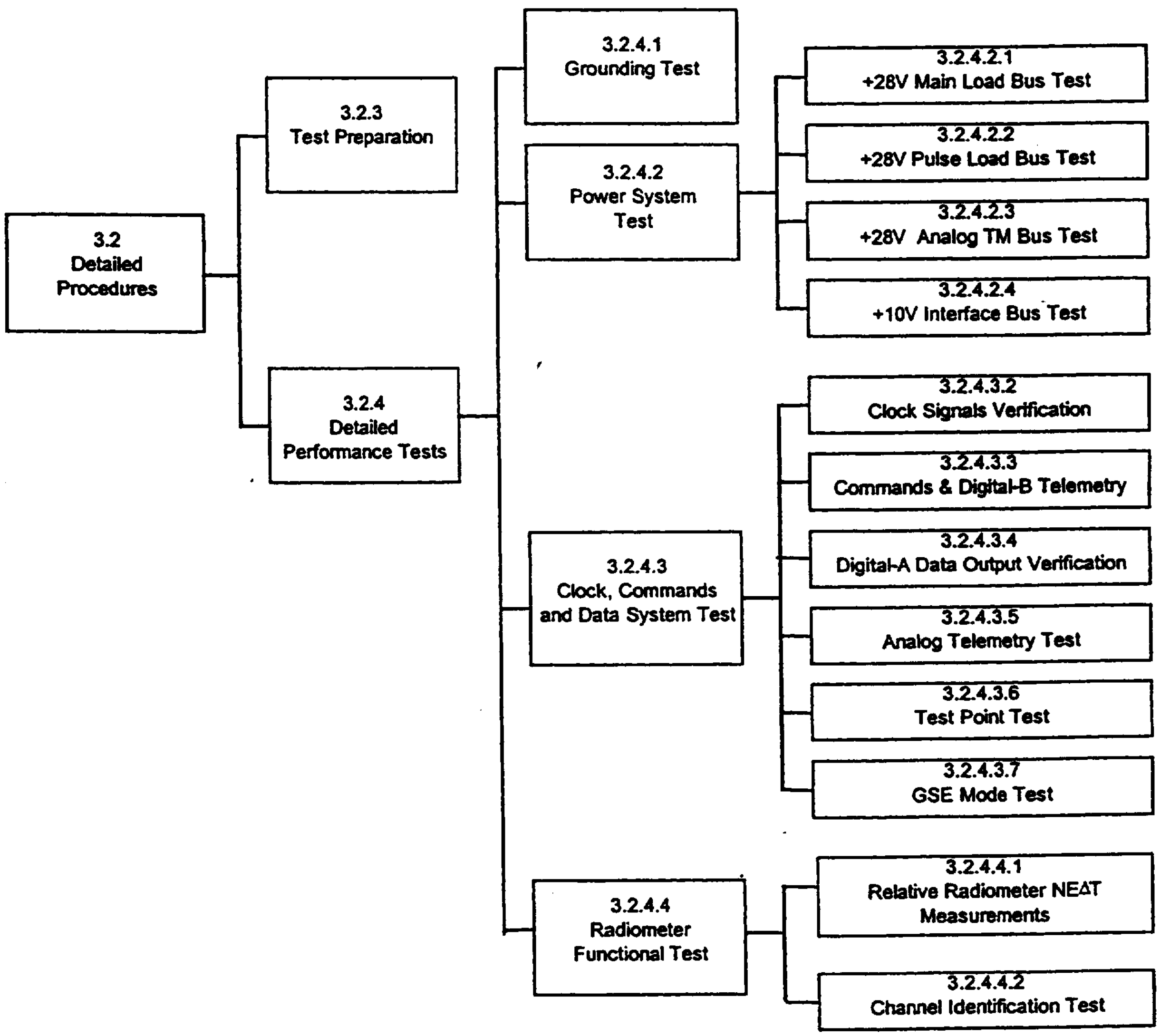

Figure 1. Test Procedure Sequence

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2. APPLICABLE DOCUMENTS

2.1 *Government documents.* The following documents form a part of this specification to the extent specified. Unless otherwise specified, the issue shown shall apply.

STANDARDS

Military

MIL-STD-45662	Calibration Systems Requirements

OTHER DOCUMENTS

S-480-79	Performance Assurance Requirements for the EOS/METSAT Integrated Programs Advanced Microwave Sounding Unit-A (AMSU-A) (PAR)
S-480-80	Performance and Operation Specification for the EOS/METSAT Integrated Programs Advanced Microwave Sounding Unit-A (AMSU-A) (POS)
GIIS-3267415	ATN-KLM General Instrument Interface Specification
UIIS-2624483	AMSU-A2 Unique Instrument Interface Specification

(Copies of government documents should be obtained as indicated in the Department of Defense Index of Specification and Standards.)

2.2 *Non-Government documents.* The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue in effect on the date of testing shall apply.

2.2.1 *Aerojet documents*

SPECIFICATION

AE-26002/2	Test Procedure, Subsystem, Antenna Drive for AMSU-A2
AE-26151/5	Test Procedure, EMI/EMR & EMC for the METSAT/METOP Advanced Microwave Sounding Unit-A (AMSU-A)
AE-26157	Special Test Equipment (STE), Operation and Maintenance Manual
AE-26357	Transportation Handling Procedure for the AMSU-A System Integrated Program

STANDARD

STD-2454	Requirements for Electrostatic Discharge Control

REPORT

10353	Contamination Control Plan for the Advanced Microwave Sounding Unit-A (AMSU-A)

DRAWING

1331200	Advanced Microwave Sounding Unit A2 (AMSU-A2)
1335695	Special Test Equipment
1356655	Console Assembly, METSAT and EOS STE

(Copies of Aerojet documents may be obtained from GenCorp Aerojet, CAGE 70143, P.O. Box 296, Azusa, California, 91702-0296).

3. REQUIREMENTS

3.1 *General test requirements*

3.1.1 ***Equipment and test facilities.*** The tests described herein shall be performed at Aerojet under laboratory conditions in an EMI shielded chamber for the first and final CPT. Other tests need not be accomplished in the EMI shielded chamber. The test equipment listed in Table I shall be used when performing the tests. If the specified equipment is not available, the equipment substituted shall provide a measurement accuracy equal to or greater than that of the specified equipment. The AMSU-A Special Test Equipment (STE) shall be used for activation and control of the unit and monitoring of its performance.

Table I. Equipment List

Item	Quantity	Item Description	Mfg.	Model
01	1	Dynamic signal analyzer	Hewlett-Packard	3562A
02	1	Signal generator	Hewlett-Packard	3314A
03	1	Oscilloscope	Tektronix	2225A
04	1	9-pin breakout box	Aerojet	2536-3743/SK1358702-1
05	1	15-pin breakout box	Aerojet	2536-3744/SK1358703-1
06	2	25-pin breakout box	Aerojet	2336-3746/SK1358704-1
07	1	37-pin breakout box	Aerojet	2536-3745/SK1358705-1
08	1	Lab. general purpose power supply	Hewlett-Packard	6114
09	1	LN_2 container	Cole	N03726-20
10	1	Spectrum analyzer	Hewlett-Packard	8590L
11	1	STE computer	Aerojet	1336695/SK1356655
12	1	STE interface cable J1	Aerojet	1335758-1
13	1	STE interface cable J2	Aerojet	1335752-1
14	1	STE interface cable J3	Aerojet	1335756-1
15	1	STE interface cable J4	Aerojet	1335755-1
16	1	STE interface cable J5	Aerojet	1335753-1
17	1	STE interface cable J6	Aerojet	1335754-1
18	1	STE interface cable J7	Aerojet	1335757-1
19	1	Current probe amp	Hewlett-Packard	AM503
20	1	Universal counter	Hewlett-Packard	5316A
21	1	Oscilloscope camera	N/A	N/A
22	1	Power supply	Power Designs	3650-S
23	1	Multimeter	Fluke	77
24	1	Plotter	Hewlett-Packard	7475A
25	1	Signal generator	Hewlett-Packard	83620B
26	1	MM-wave source module	Hewlett-Packard	83557A
27	1	Couple/detector	Hewlett-Packard	83557-60001
28	1	Spectrum analyzer	Hewlett-Packard	8563E

* For limited performance test only; item numbers 04, 06, 09, 11 through 18, and 23 are required.

3.1.2 ***Required procedures and operations.*** The unit shall be subjected to the examinations and tests specified in 3.2.4 and Table II.

3.1.2.1 ***Limited performance test (LPT).*** The Limited Performance Test shall consist of the test procedures specified in the LPT column of Table II.

3.1.2.2 ***Comprehensive performance test (CPT).*** Three versions of the Comprehensive Performance Test are identified in Table II. These are applicable for different test stages. The test procedures to be performed for each version are specified in the 1st CPT, Sub CPT, and Final CPT columns of Table II.

Table II. AMSU-A2 Performance Tests

Paragraph	Test Description	1st CPT	LPT	Sub CPT	Final CPT
3.2.4.1	Grounding Test	X	X	X	X
3.2.4.2.1.1	+28 Main Load Bus (MLB) Turn-On Transient	X			X
3.2.4.2.1.2	+28 MLB Operating Power	X	Note 1	Note 2	X
3.2.4.2.1.3	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.1.4	Instrument Feedback Test	Note 7			
3.2.4.2.2	+28 Pulse Load Bus (PLB) Test	X		Note 3	X
3.2.4.2.2.8	Instrument Feedback Test	Note 7			
3.2.4.2.2.9	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.3	+28 Analog Telemetry Bus (ATB) Test	X		X	X
3.2.4.2.3.2	Instrument Feedback Test	Note 7			
3.2.4.2.3.3	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.4	+10 V Interface Bus Test	X		X	X
3.2.4.2.4.2	Instrument Feedback Test	Note 7			
3.2.4.3.2	Clock Signals Test	X			X
3.2.4.3.3	Commands and Digital-B Telemetry Test	X	X	X	X
3.2.4.3.4	Digital-A Data Output Test	X	Note 4	Note 4	X
3.2.4.3.5	Analog Telemetry Test	X	Note 5	Note 5	X
3.2.4.3.6	Test Point Test	X		X	X
3.2.4.3.7	GSE Mode Test	X Note 6			
3.2.4.4	Radiometer Functional Test	X	X	X	X
3.2.4.4.2	Channel Identification Test	X			

Notes:
1. 3.2.4.2.5 (Power input test for LPT).
2. At 28V only.
3. 3.2.4.2.2 except 3.2.4.2.2.5 through 3.2.4.2.2.7.
4. Only full scan.
5. STE only (3.2.4.3.5.2).
6. GSE mode test/verification is not required and is for engineering use only.
7. Instrument feedback test will be performed in EMI/RFI Chamber using EMI/RFI test procedure AE-26151/5.

3.1.3 *Inspection instructions*. The following shall apply to all inspections performed under this specification.

a. **Personnel familiarization:** All personnel directly concerned with the conduct of the inspection shall become familiar with the entire content of this document before beginning the tests. Each step, including all notes, warnings, and cautions, shall be understood thoroughly before starting.

b. **Referenced documents:** Performance of the tests specified herein may require reference to the documents listed in Section 2. It is recommended that the applicable issues of these documents be available at the time and place of testing.

3.1.4 *Test conditions*. The following paragraphs shall apply to all testing described in this document.

3.1.4.1 *Standard ambient conditions*. Unless otherwise specified in a detailed method paragraph, all handling shall be performed under the following laboratory ambient conditions:

a. Handling in accordance with AE-26357

b. Contamination control in accordance with Report 10353

c. Temperature: +23 ± 10°C

d. Pressure: 610 to 810 torr

e. Humidity: 50 ± 20% (no condensation)

f. The instrument shall be placed in its protective bag (1338427) when not in use.

3.1.4.2 *Test tolerances*. The tolerances allowed on test conditions are intended only to provide for accuracy of such items as instrumentation and controls. Conditions shall be as close as possible to the nominal or center values specified, and in no instance shall they exceed the tolerances specified. Unless otherwise specified, the tolerances shall be within ± 10%.

3.1.4.3 *Read-out accuracy*. Parameters are specified either as limits or as nominal values with plus-or-minus tolerances. These limits and tolerances shall be regarded as absolute, and the inaccuracies of measuring equipment shall not be interpreted as part of measured values in such a way that out-of-limit measurements may appear in-limit.

3.2 *Detailed procedures*

3.2.1 *Responsibility for inspection*. All tests specified herein shall be performed under the cognizance of Aerojet Quality Assurance.

3.2.2 *Monitoring procedures for equipment*. Test equipment calibration schedules and procedures shall comply with the requirements of MIL-STD-45662. Before performing examinations and tests in accordance with this procedure, all test equipment to be used shall be verified as being within their current calibration periods. Calibration or alignment, necessary for operation of the equipment within the requirements of this document, shall be performed when required.

3.2.3 *Test preparation*. Perform the following preparations.

3.2.3.1 *STE connection*. The power sources, signal sources, and loads are provided to the unit under test by the AMSU-A Special Test Equipment (STE) (Drawing 1335695 or 1356655), in accordance with paragraph 5.2 of S-480-80. The STE is automated test equipment controlled by a MicroVax computer. The unit shall be connected to the STE in accordance with AE-26157 and the detailed test procedures in 3.2.4.

3.2.3.2 *Signal sources*. Signal sources required during the performance test but not provided by the STE are as follows:

a. Cold background at LN_2 temperature at room ambient.

b. +28 Vdc ± 1 Vdc, 3 Amps.

3.2.3.3 ***Signal outputs***. Signal outputs, except for the test signals at J7, shall be monitored by the STE. The signal outputs at J7 are shown in Figure 2.

3.2.3.4 ***Test software***. AMSU-A2 bonded software shall be used to operate the STE. During initialization of the STE, as specified in AE-26157, the A2 software shall be selected. The bonded software is being selected by the STE computer automatically during initialization of the STE.

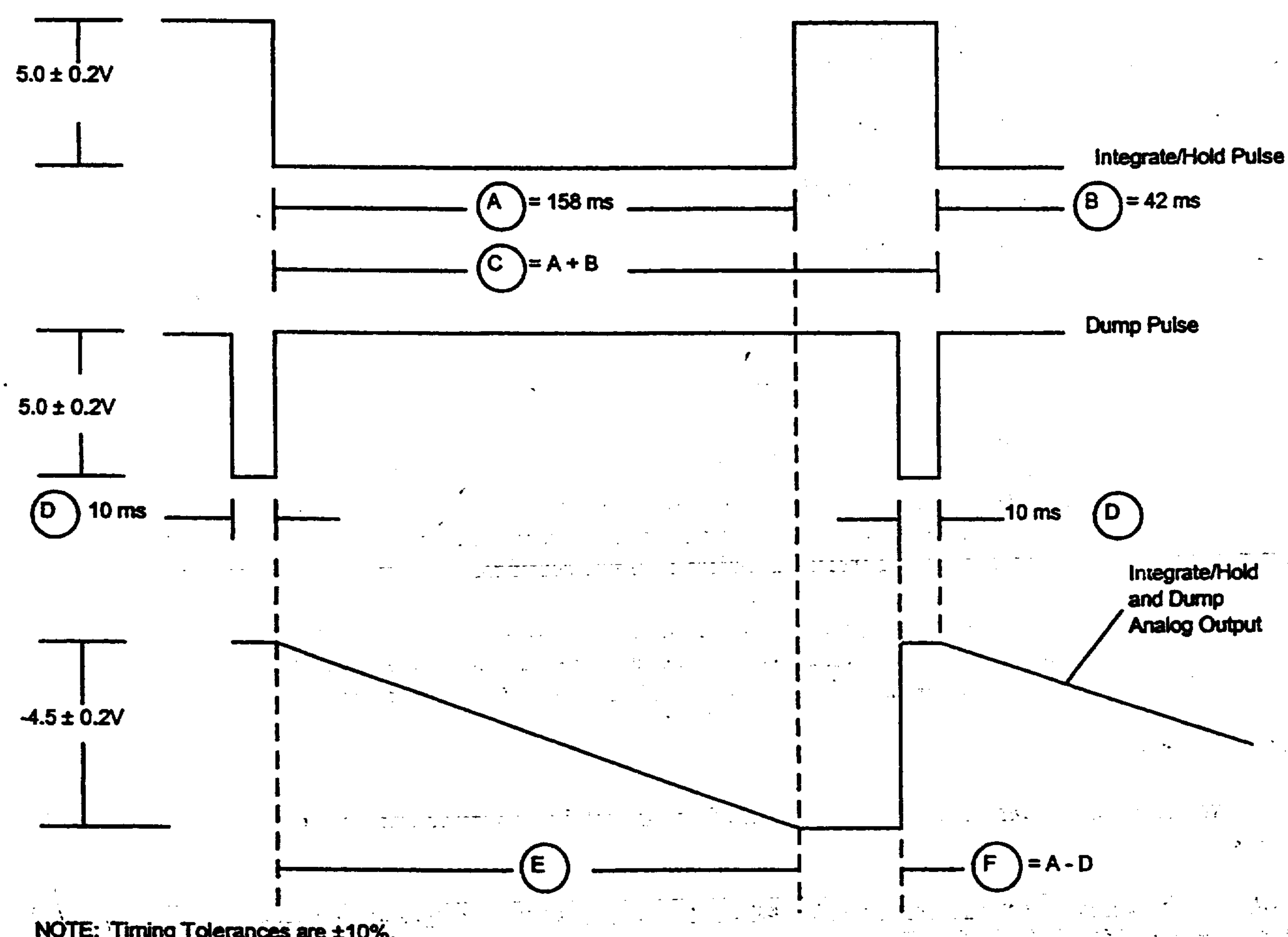


Figure 2. Signal Output at J7

3.2.3.5 ***Initial turn-on***. When called for in the individual test procedures, turn on the unit as follows:

1. Turn on power to STE, initialize STE (per AE-26157 instructions), and turn on AMSU-A2 STE power switches. Adjust +28 V power supply by using DVM to +28.0 V ± 0.5V at STE J1 connector pin No. 1 (+) and pin No. 3 (RTN). Use breakout box at J1 to connect the DVM.

2. Enter the serial number (decimal equivalent of the identification number provided in the UIIS) for the unit under test using AE-26157, if necessary. Verify that the Main Menu is displayed on the STE CRT terminal display. Turn off the AMSU-A2 STE power switches.

3. Connect J1 through J7 to AMSU-A2 unit.

4. Verify that the PWR and SW/TM switches on the STE power distribution unit are ON.

5. On the Main Menu, press the [2] MONITOR ONLY (type the number). The Monitor Only Menu will be displayed, with Block Monitor Data Select options shown in the middle (window) area of the screen.

6. On the Monitor Only Menu, press [14] COMMANDS. The Commands Menu will be displayed in the window area.

7. On the Commands Menu, press [9] MODULE POWER. Wait at least 18 seconds for command execution. This applies power to the unit.

8. Execute commands as necessary to obtain the following configuration:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

9. Wait at least 18 seconds and observe the commands are acknowledged by STE.

10. Verify that the STE power supply is adjusted to its normal +28.0 Vdc ±0.5 Vdc operating voltage by using a DVM across J1-1 and J1-3. Use 25-pin breakout box at J1 to connect the DVM.

11. Verify that all breakout box switches are in the closed position.

12. After initial turn-on, execute commands and connect the unit as necessary according to the individual test procedures.

3.2.3.6 ***Turn-off methods***. The unit can be turned off immediately by pressing [9] MODULE POWER = DISCONNECT on the Commands Menu. For a phased shutdown, press [11] MODULE TOTALLY OFF = OFF on the Command Menu or press POWER [4] OFF on any display. When connecting breakout boxes to the unit or STE connectors, verify that the unit power is off and the STE +28V power supply is manually turned off.

3.2.4 ***Detailed performance tests***. The comprehensive performance tests for the AMSU-A2 system are to be carried out on the fully assembled and operational unit. The tests to be performed are as follows:

a. Grounding system test.

b. Power system test.

c. Clock, commands and data system test.

d. Radiometer functional test.

e. Transient susceptibility and power quality test.

f. Instrument feedback tests.

3.2.4.1 ***Grounding test.*** This test provides the verification of the unit grounding requirements of GIIS-3267415 Paragraph 3.1.1 and UIIS-2624483 paragraph 3.11.

1. Connect breakout boxes to each of the spacecraft interface connectors J1 through J7 as shown in Figure 3. Verify that all connectors are protected with connector savers. Verify STE is not connected to instrument.

2. Measure and record continuity or isolation between the points shown on Test Data Sheet (TDS) 1 (Appendix B, TDS B-1 for LPT).

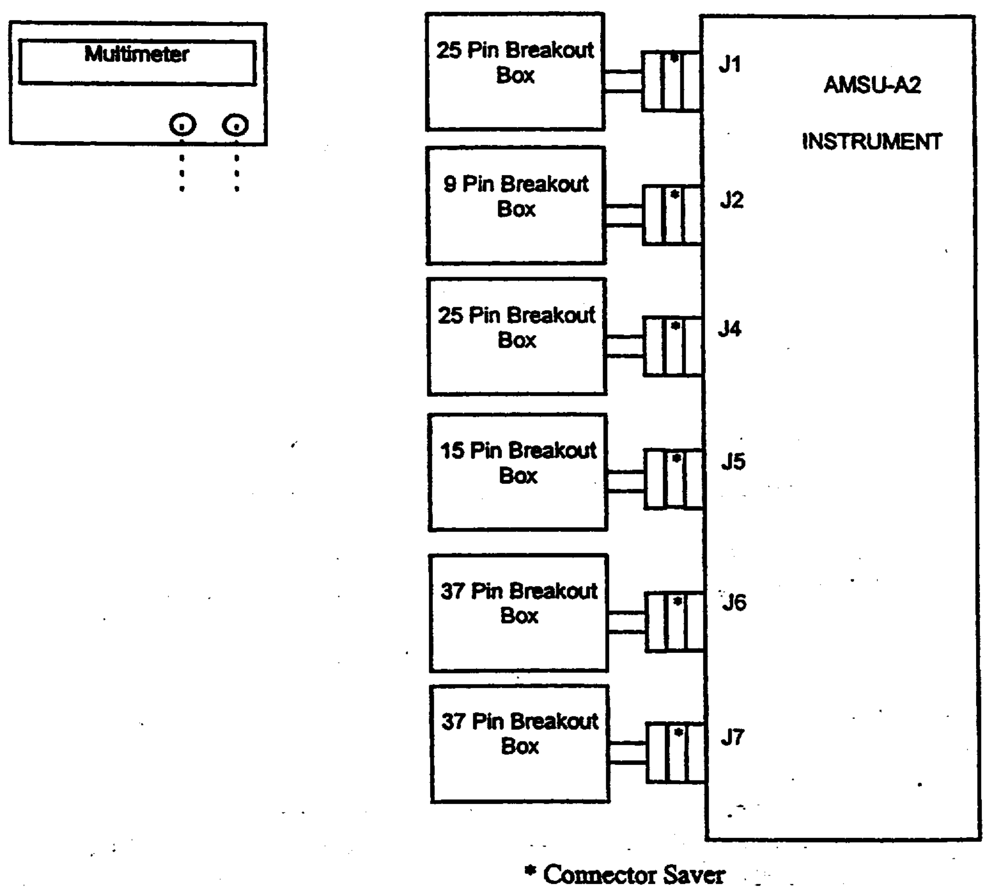


Figure 3. Grounding Test Setup

3.2.4.2 ***Power system, transient susceptibility, power quality, and instrument feedback tests.*** The purpose of these tests is to verify power system compliance in regard to:

a. Turn on transients

b. Operating power

c. Transient susceptibility

d. Current ripple

The following DC voltage lines will be tested for the above parameters:

e. +28V Main Load Bus (parameters a, b, c, d)

f. +28V Pulse Load Bus (parameters a, b, c, d)

g. +28V Analog Telemetry Bus (parameters b, c, d)

h. +10V Interface Bus (parameters b, d)

3.2.4.2.1 ***+28V main load bus test***

3.2.4.2.1.1 ***+28V MLB during turn on transient.*** The +28V MLB turn on transient shall be verified as follows:

1. Configure the unit and test equipment as shown in Figure 4. Verify that switches 1, 2, 14 and 15 of the breakout box are in the OPEN position. Disconnect +28 Vdc external power supply output and adjust the power supply to read 28.56 Vdc ± 0.05 Vdc on voltmeter No. 1. Connect the power supply output as shown in Figure 4.

2. Configure the Dynamic Signal Analyzer (DSA) as follows:

Select **MEAS MODE**
- Select *Time Capture*
- Select *Capture Select*
- Select *Capture Length*; Enter *300.0*; Select *msec*

Select **FREQ**
- Select E SMPL *Off*
- Select *Freq Span*; Enter 25; Select *kHz*

Select **SELECT MEAS**
- Select *Power Spec*
- Select *CH1 Active*

Select **WINDOW**
- Select *Hann*

Select **SOURCE**
- Select Source *Off*

Select **AVG**
- Select Avg *Off*
- Select Tim Av *Off*

Select ***RANGE***
- Select *Chan 1 Range;* Enter *1;* Select *V*

Select **INPUT COUPLE**
- Select CH1 *DC*
- Select CH1 *Ground*

Select **INPUT TRIG**
- Select *Trig Level;* Enter *100;* Select *mv*
- Select Arm *AU*
- Select *Ext;* Select *(-) Slope*

Select **TRIG DELAY**
- Enter *0;* Select *μSec*

Select **COORD**
- Select *Real*

Select **VIEW INPUT**
- Select *Time Buff*

Select **SCALE**
- Select *X Fixd Scale:* Enter *0.0, 300;*
- Select *msec*
- Select *Y Fixd Scale*; Enter *0.0, 80;*
- Select *mV*

Select **UNITS**
- Select *Hz (sec)*

NOTE

Prior to collecting any current data, the current meter and DSA have to be "zeroed out"; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 1.0 A/ 10 mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetically benign location.

c) Adjust the "y" axis voltage range to ±4 mV.

d) Place the DSA in "Free Run" Trigger and depress "Start Capture" on the DSA.

e) With the "capture in process", adjust the "output DC level" control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 4, and return the DSA to "Ext" trigger.

3. Turn the unit ON by selecting [9] MODULE POWER; setup the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, re-adjust the external power supply for 28 Vdc.

			COMMANDS		
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

4. Turn the unit OFF by executing command [9] MODULE POWER. Confirm the command has been executed on the STE display.

5. Start the DSA signal capture by depressing "Start Capture"; wait for the DSA message "waiting for trigger" before proceeding.

6. On the STE computer, select [9] MODULE POWER and obtain a record of the +28 MLB Turn-On current waveform. On the STE computer, select [9] MODULE POWER to turn the instrument's power OFF. Adjust the display time base and voltage sensitivity to allow for adequate current and pulse duration measurements (refer to Figure 5 for an example of per division values). Plot the obtained waveform and attach a hard copy of the scan to TDS 2.

7. Measure the Turn-On time to reach steady state current; record this value on TDS 2.

8. Compute the peak current as follows:

   Multiply the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 1.0 A/ 10 mV per division, and the maximum Y value = 46.8 mV:

   46.8 mV x (1.0 mA/10 mV) = 4.68 amps

Record this value on TDS 2.

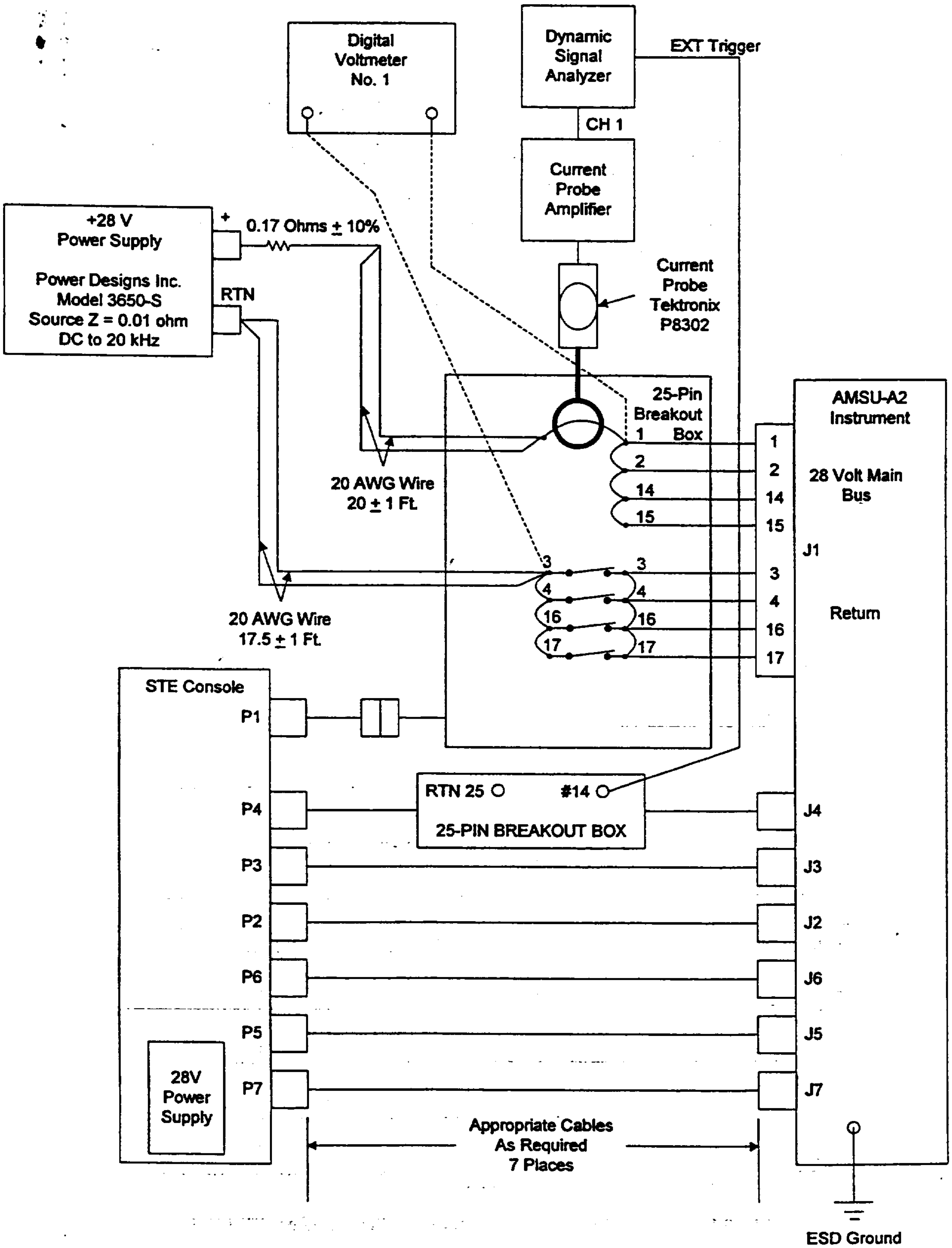
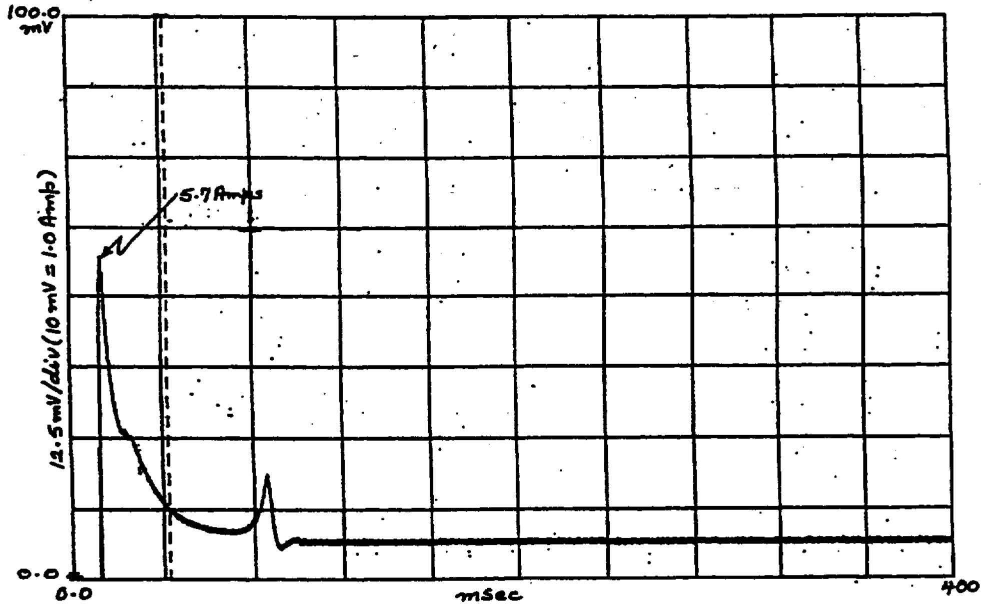
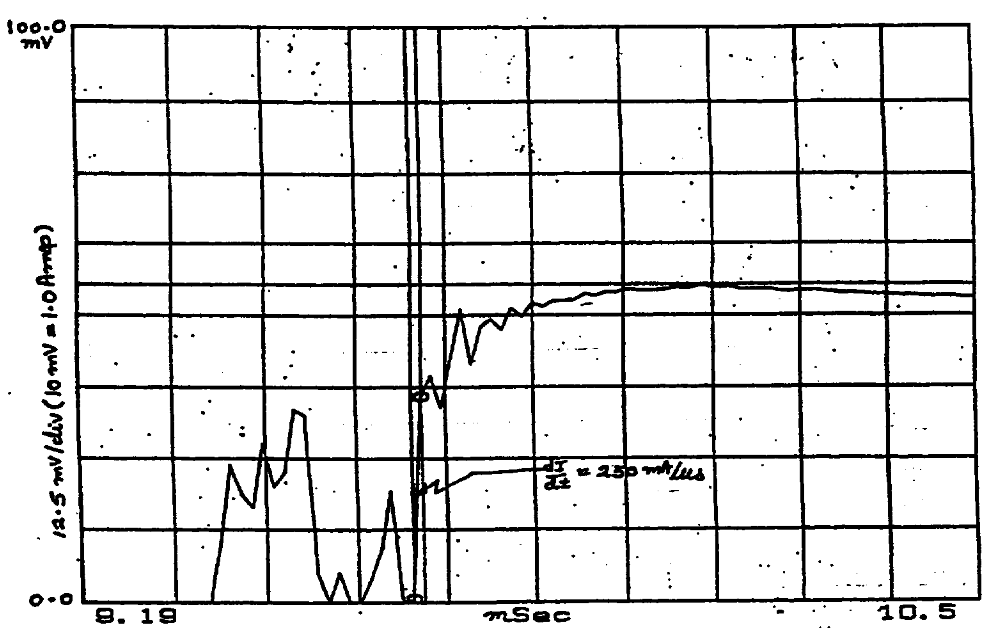


Figure 4. +28V Main Load Bus Verification Setup

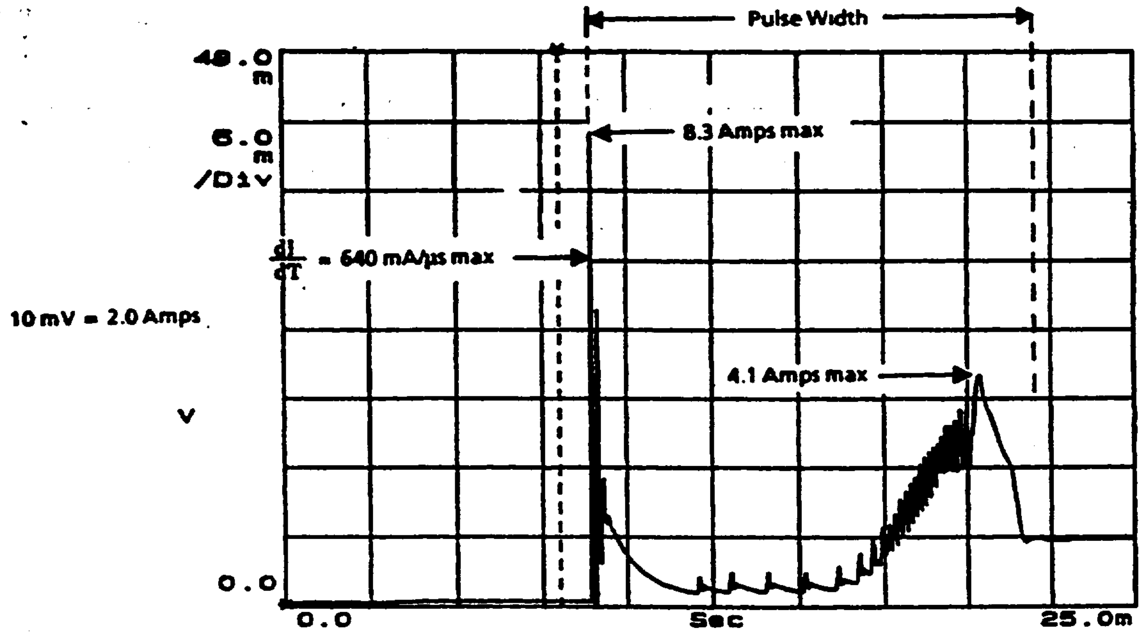


+28 Volt Main Bus Peak Power Worst Case Profile (For S/N 105 through 109)



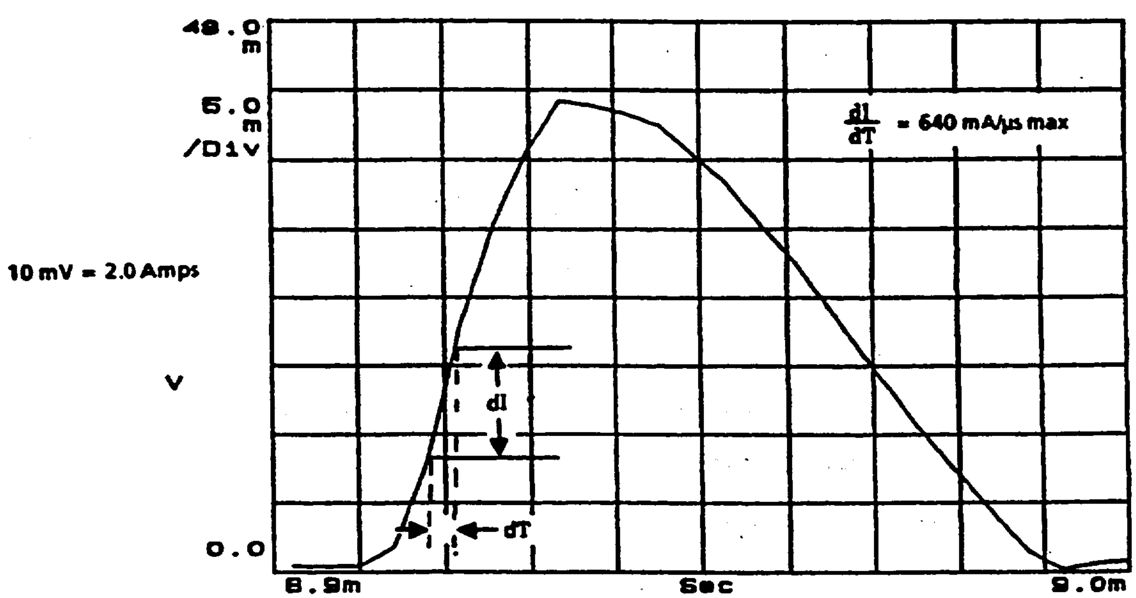
+28 Volt Main Bus Peak Power Worst Case Profile (For S/N 105 through 109)

Figure 5. +28V Main Bus Load Peak Power



1 div = 2.5 ms

AMSU-A2 (S/N 102, 103, and 104) Main Load Bus Worst Case Turn-on Transient at 28.56 Vdc.



1 div = 0.01 ms

AMSU-A2 (S/N 102, 103, and 104) Main Load Bus $\frac{dI}{dT}$ at Worst Case Turn-on Transient at 28.56 Vdc.

Figure 5. +28V Main Bus Load Peak Power

9. The 1st derivative of the current waveform must be calculated. Compute the dI/dT as follows:
   The most probable location of the greatest current demand is during the first positive transition after voltage application. If this is the case, expand the segment of the display and measure the greatest voltage transition in the smallest time transition. The change in voltage times the current/div as selected on the current amplifier produces the change in current. Next divide this change in current by the change in time (in microseconds). This value is dI/dT. Example:

   Change in voltage .... 35.29 mV
   Change in time (microseconds) .... 31.25 µs
   Current/div on current amplifier .... 1000 mA/ 10 mV

   $$35.29 \text{ mV} \times (1000 \text{ mA}/\ 10 \text{ mV})/31.25\ \mu\text{s} = 112.9 \text{ mA}/\ \mu\text{s}$$

10. Record the computed value on TDS 2.

11. With the multimeter, adjust the external power supply to 27.44 ±0.05 Vdc as measured between J1-1 (high) and J1-3 (low).

12. Repeat steps 3 through 10.

13. With the multimeter, adjust the external power supply to 28.00 ±0.05 Vdc as measured between J1-1 (high) and J1-3 (low).

14. Repeat steps 3 through 10.

3.2.4.2.1.2 ***+28V MLB operating power***. Measure the steady state current, voltage, and power as follows:

1. Turn off the unit.

2. Insert current meter in positive lead of external power supply.

3. Turn the unit on as indicated in 3.2.3.5.

4. While monitoring voltmeter No. 1, adjust the power supply to 27.0 ± 0.1 volts (see Figure 4). Record the voltage displayed on voltmeter no. 1 on TDS 3 (MLB voltage at 27 V).

5. Record the operating current on TDS 3 using digital multimeter.

6. Compute the operating power (watts) as explained in TDS 3.

7. Adjust the power supply to 28.0 ± 0.1 volts and record voltage on TDS 3.

8. Record the operating current on TDS 3.

9. Compute the operating power (watts) as explained in TDS 3.

10. Adjust the power supply to 29.0 ± 0.1 volts and record voltage on TDS 3.

11. Record the operating current on TDS 3.

12. Compute the operating power (watts) as explained in TDS 3.

13. Adjust the power supply to 28.0 ± 0.5 Vdc.

3.2.4.2.1.3 ***Transient susceptibility and power quality tests***. The power tests that follow will demonstrate the AMSU-A2 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines..

3.2.4.2.1.3.1 ***Equipment setup***. Set up the test equipment and connect to the instrument as shown in Figure 6.

3.2.4.2.1.3.2 ***Low frequency load induced transients***. The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the power line at the amplitude and duration specified in Figure 7. Perform Low Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. Place the signal generator in ARB 0 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 7.

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.

8. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

3.2.4.2.1.3.3 ***High frequency load induced transients***. The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

Perform High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:

amplitude	200 mVpp
offset	0.000 V
frequency	1.430 Hz

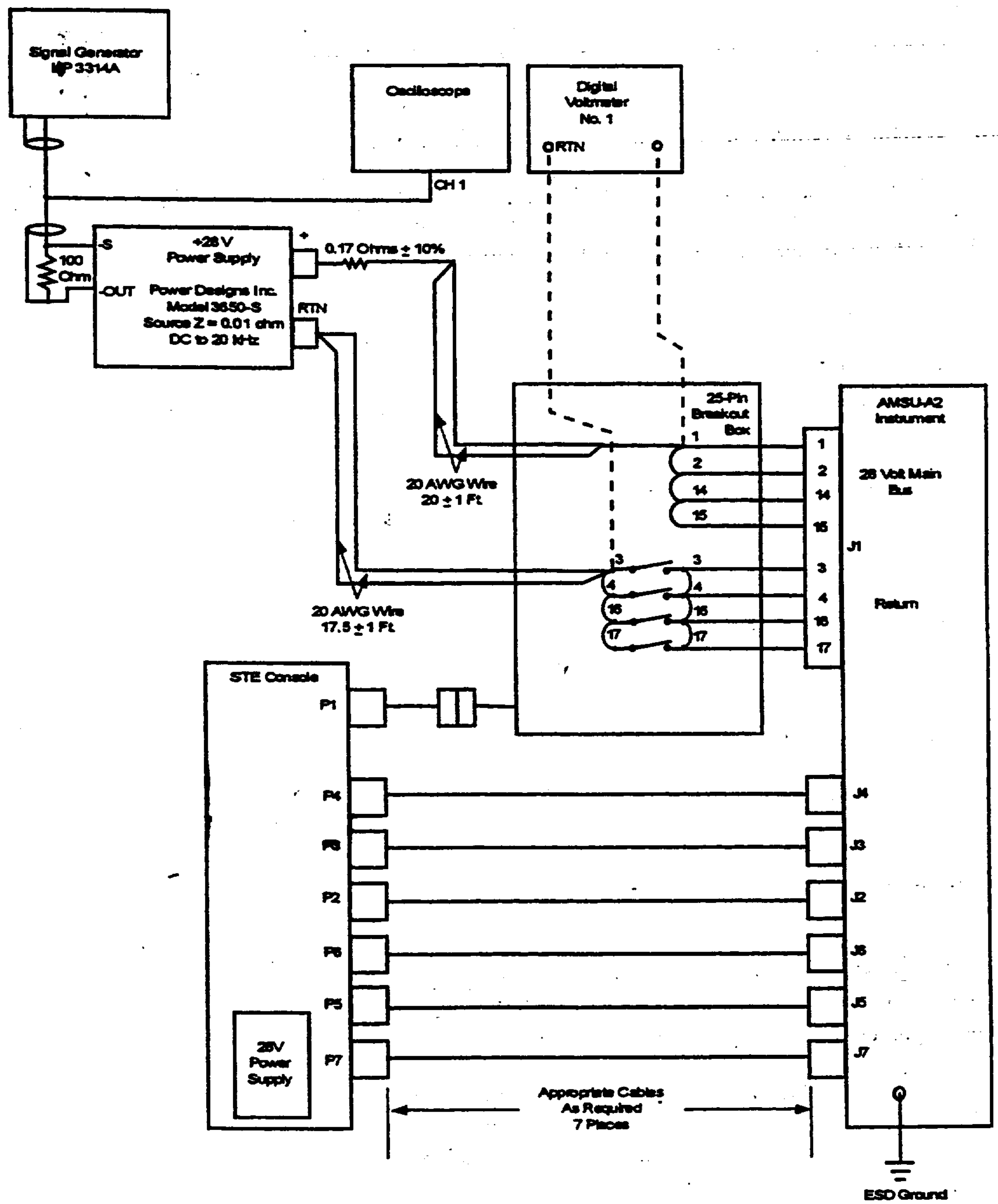


Figure 6. +28 V MLB Transient Susceptibility and Power Quality Tests Setup

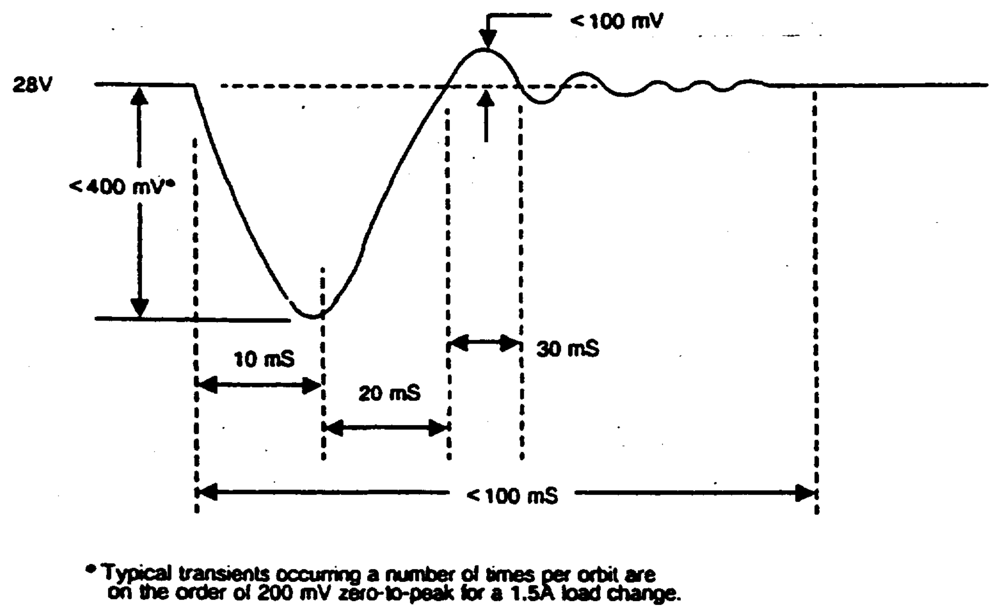


Figure 7. Load Induced Transient (Main Bus)

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

8. Repeat steps 2 through 4, and 6 through 7 for 2.86 Hz and 1.0 Vpp.

9. Repeat steps 2 through 4, and 6 through 7 for 6.67 Hz and 1.5 Vpp.

10. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

3.2.4.2.1.4 *Instrument feedback test*. The instrument feedback test is performed in accordance with AE-26151/5. (See Table II.)

3.2.4.2.2 *+28V pulse load bus test*. The PLB shall be verified during the following intervals:

a. First two seconds (3.2.4.2.2.1)

b. From 2 to 4 seconds (3.2.4.2.2.2)

c. From 4 to 6 seconds (3.2.4.2.2.3)

d. From 6 to 8 seconds (3.2.4.2.2.4)

e. 8 second PLB integration (current) (3.2.4.2.2.5)

f. PLB turn-on transient (3.2.4.2.2.7).

g. PLB current in warm cal, cold cal, and nadir modes (3.2.4.2.2.6)

h. Instrument feedback (3.2.4.2.2.8)

i. Transient susceptibility (3.2.4.2.2.9).

3.2.4.2.2.1 ***PLB during the first two seconds***. The PLB operation, during the first two seconds, shall be verified as follows:

1. Configure the unit and test equipment as indicated in Figure 8. Verify that switches 5, 6, 18 and 19 of the breakout box are in the OPEN position. Disconnect +28 Vdc external power supply output and adjust the power supply to read 28.00 Vdc ± 0.05 Vdc by using a digital voltmeter. Connect the power supply output as shown in Figure 8.

2. Configure the Dynamic Signal Analyzer (DSA) as follows:

Select **MEAS MODE**
- Select *Time Capture*
- Select *Capture Select*
- Select *Capture Length*; Enter *1*; Select *Record*

Select **FREQ**
- Select *Freq Span;* Enter *100.0*; Select *Hz*
- Select E SMPL *Off*
- Select *Time Length*; Enter *8.0*; Select *Sec*

Select **SELECT MEAS**
- Select *Power Spec*
- Select CH1 *Active*

Select **WINDOW**
- Select *Hann*

Select **SOURCE**
- Select Source *Off*

Select **AVG**
- Select Avg *Off*
- Select Tim Av *Off*

Select ***RANGE***
- Select *Aut 1 Rng up*

Select **INPUT COUPLE**
- Select CH1 *DC*
- Select CH1 *Ground*

Select **INPUT TRIG**
- Select *Trig Level;* Enter *1.5;* Select *V*
- Select *Arm AU*
- Select *Ext*
- Select *Slope -*

Select **TRIG DELAY**
- Enter 0.0; Select *Sec*

Select **COORD**
- Select *Real*

Select **VIEW INPUT**
- Select *Time Buff*

Select **SCALE**
- Select *X Fixd Scale:* Enter *0.0, 8.0;* Select *Sec*
- Select *Y Fixd Scale*; Enter *-10.0, 70.0;* Select *mv*

Select **UNITS**
- Select *Hz (sec)*

NOTE

Prior to collecting any current data, the current meter and DSA have to be "zeroed out"; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 200 mA/ 10mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetically benign location.

c) Adjust the "y" axis voltage range to ±4 mV

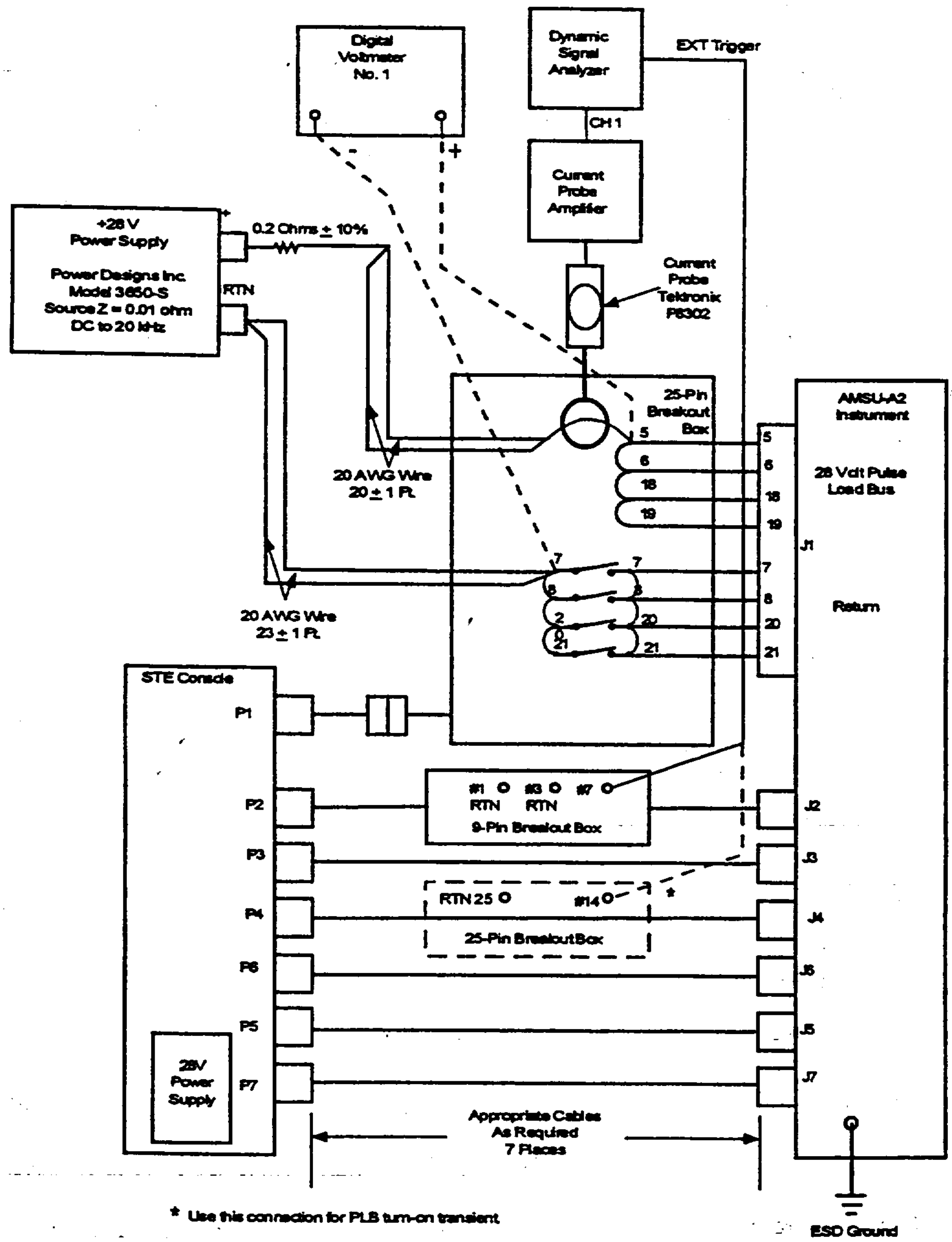


Figure 8. +28V Pulse Load Verification Setup

d) Place the DSA in "Free Run" Trigger and depress "Start Capture" on the DSA.

e) With the "capture in process", adjust the "output DC level" control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 8, and return the DSA to "Ext" trigger.

The instrument is now ready to capture and plot 8 seconds of data.

3. Turn the unit ON by selecting [9] MODULE POWER, set up the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, re-adjust the external power supply for 28 Vdc.

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

4. Start the DSA signal capture by depressing "Start Capture".

5. Obtain the first 2-second PLB current waveform by selecting zero to 2 seconds time span. Refer to Figure 9 for a typical waveform. Turn OFF the "X" cursor if it is ON. Turn the "X" cursor ON. The cursor will appear at the highest peak. Ensure this value is less than or equal to 2.2 amps. Record value on TDS 4.

6. Compute the peak current as follows:
Multiply the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 200 mA/ 10 mV per division, and the maximum Y value = 276 mV:

$$100\text{ mV} \times (200\text{ mA}/10\text{ mV}) = 2000\text{ mA} = 2.00\text{ amps}$$

3.2.4.2.2.2 ***PLB measured from 2 to 4 seconds.*** The PLB operation, from 2 to 4 seconds, shall be verified as follows:

1. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 1.9 seconds.

2. Obtain a hard copy of the signal displayed on the dynamic signal analyzer (refer to Figure 9 for typical waveform) and record the peak current and bus current during the integrate/hold, dump (I/H,D) time period (refer to Figure 9) data on TDS 4.

3.2.4.2.2.3 ***PLB measured from 4 to 6 seconds.*** The PLB operation, from 4 to 6 seconds, shall be verified as follows:

1. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 3.9 seconds.

2. Obtain a hard copy of the signal displayed on the dynamic signal analyzer (refer to Figure 9 for typical waveform) and record the peak current and bus current during the integrate/hold, dump (I/H,D) time period (refer to Figure 9) data on TDS 4.

3.2.4.2.2.4 ***PLB measured from 6 to 8 seconds.*** The PLB operation, from 6 to 8 seconds, shall be verified as follows:

1. Change the PRE-TRIGGER DELAY setting of the dynamic signal analyzer to 5.9 seconds.

2. Obtain a hard copy of the signal displayed on the dynamic signal analyzer (refer to Figure 9 for typical waveform) and record the peak current and bus current during the integrate/hold, dump (I/H,D) time period (refer to Figure 9) data on TDS 4.

3.2.4.2.2.5 ***Eight second integrated current measurement.*** To observe the PLB integrated (8 sec.) current waveform on the dynamic signal analyzer, configure the dynamic signal analyzer as follows:

1. Select **SCALE**
   Select X Fixd Scale; Enter 0.0, 8; Select Sec
   Select Y Fxd Scale; Enter –10, 70.0; Select mV
2. Select **VIEW INPUT**
   Select Time Record: Note – the display heading changes to read "Cap Tim Rec"
3. Select **MATH**
   Select Next
4. Select **Intgrt**:
   Note – the display changes to present an integrated value of the current waveform.
5. Select **X (cursor)**
   Move the X marker to the maximum right of the display. The Y value is indicative of the integrated current value over the entire 8 second period.

6. Multiply the maximum Y value by the current/div as selected on the current amplifier, then divide by 8 seconds to acquire an average current value. As an example: if the current amplifier is set up to display 200 mA/ 10 mV per division, and the maximum Y value = 32.4 mV-sec:

   [32.4 mV-sec x (200 mA/ 10 mV)]/8 sec = 81 mA

   Enter the calculated integrated value on TDS 4.

3.2.4.2.2.6 ***PLB current in warm cal, cold cal, and nadir modes.*** PLB current shall be tested as follows:

1. Place the unit in warm cal mode.

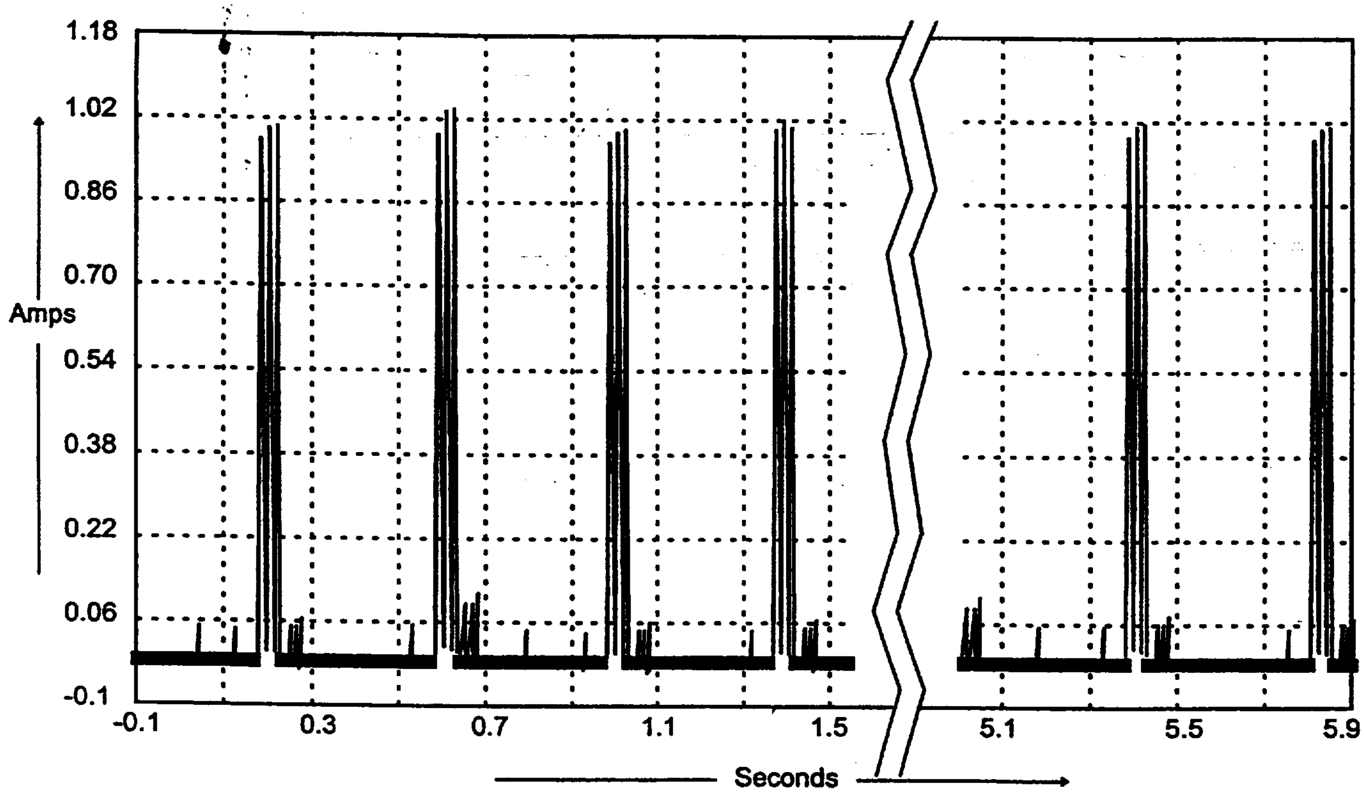
2 Measure and record PLB steady state current on TDS 4 with a multimeter in the current mode.

3. Place the unit in cold cal mode and repeat step 2.

4. Place the unit in nadir mode and repeat step 2.

3.2.4.2.2.7 ***PLB turn-on transient***

1. Configure the unit and test equipment as shown in Figure 8. Verify that switches 5, 6, 18 and 19 of the breakout box are in the OPEN position. Connect the DSA External trigger to the identified pins on the 25-pin breakout box.



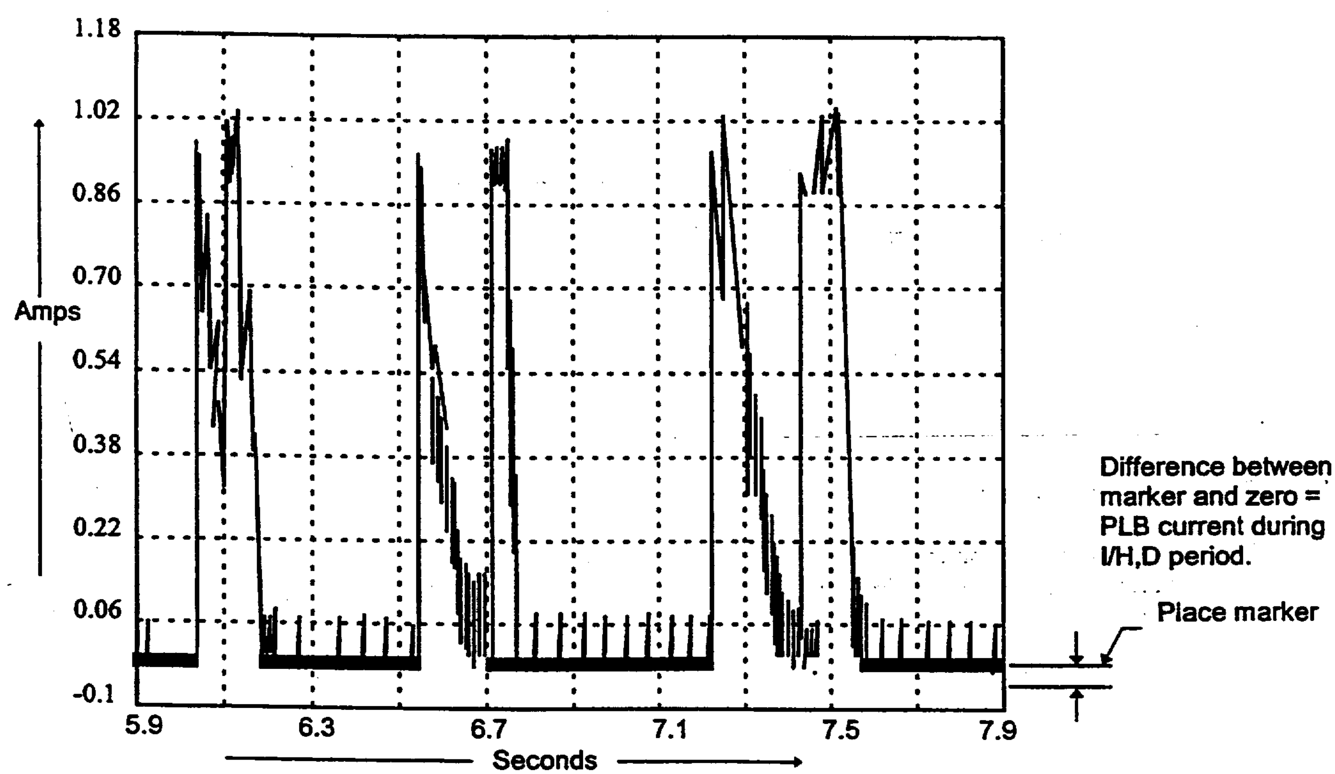


Figure 9. Typical Load Current Waveforms from the +28V Pulse Load Bus

2. Configure the Dynamic Signal Analyzer (DSA) as follows:

Select **MEAS MODE**
- Select *Time Capture*
- Select *Capture Select*
- Select *Capture Length*; Enter *500.0*; Select *msec*

Select **FREQ**
- Select *Freq Span*; Enter *20.0*; Select kHz
- Select E SMPL *Off*
- Select *Time Length*; Enter 32.*0*; Select *msec*

Select **SELECT MEAS**
- Select *Power Spec*
- Select *CH1 Active*

Select **WINDOW**
- Select *Hann*

Select **SOURCE**
- Select *Source Off*

Select **AVG**
- Select *Avg Off*
- Select *Tim Av Off*

Select ***RANGE***
- Select *Chan 1 Range;* Enter *1*
- Select *V*

Select **INPUT COUPLE**
- Select *CH1 DC*
- Select *CH1 Ground*

Select **INPUT TRIG**
- Select *Trig Level;* Enter *1*
- Select *V*
- Select *Arm AU*
- Select *Ext;* Select *Slope(-)*

Select **TRIG DELAY**
- Enter 0; Select *μSec*

Select **COORD**
- Select *Real*

Select **VIEW INPUT**
- Select *Time Buff*

Select **SCALE**
- Select *X Fixd Scale:* Enter *0.0, 25*
- Select *msec*
- Select *Y Fixd Scale*; Enter *–10, 470*
- Select *mv*

Select **UNITS**
- Select *Hz (sec)*

NOTE

Prior to collecting any current data, the current meter and DSA have to be "zeroed out"; zero current reference has to be established on the DSA. Follow this interim procedure to zero reference the current meter and DSA.

a) Select 200 mA/ 10 mV per div. on the current amplifier.

b) Remove the current probe from the circuit and close the probe. Place the probe in a magnetically benign location.

c) Adjust the "y" axis voltage range to ±4 mV.

d) Place the DSA in "Free Run" Trigger and depress "Start Capture" on the DSA.

e) With the "capture in process", adjust the "output DC level" control on the current amplifier to indicate zero current on the DSA.

f) Position the current probe to its original location in accordance with Figure 7, and return the DSA to "Ext" trigger.

3. Adjust external power supply for +28 Vdc. Turn the unit ON by selecting [9] MODULE POWER; setup the operating modes as defined in paragraph 3.2.3.5 (reference the command screen parameters below). If necessary, re-adjust the external power supply for 28 Vdc.

COMMANDS				
[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO [15]
[10]	SURVIVAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO [16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES [17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO [18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO [19]
[14]	ANTENNA WARM CAL POS =	NO		
POWER [4] ON				

4. Turn the unit OFF by executing command [9] MODULE POWER. Confirm the command has been executed on the STE display.

5. Start the DSA signal capture by depressing "Start Capture"; wait for the DSA message "waiting for trigger" before proceeding.

6. On the STE computer, select [9] MODULE POWER and obtain a record of the +28 PLB Turn on current waveform. On the STE computer, select [9] MODULE POWER to turn the instrument's power OFF. Adjust the display time base and voltage sensitivity to allow for adequate current and pulse duration measurements. Plot the obtained waveform and attach a hard copy of the scan to TDS 4. Refer to Figure 10 for an example of the expected waveform.

7. Measure the Turn-On pulse width; record this value on TDS 4.

8. Compute the peak current as follows:

   Measure the maximum Y value by the current/div as selected on the current amplifier. As an example, if the current amplifier is set up to display 200 mA/ 10 mV per division, and the maximum Y value = 276 mV:

   276 mV x (200 mA/ 10 mV) = 5520 mA = 5.52 amps

   Record this value on TDS 4.

9. The 1st derivative of the current waveform must be calculated. Compute the dI/dT as follows:

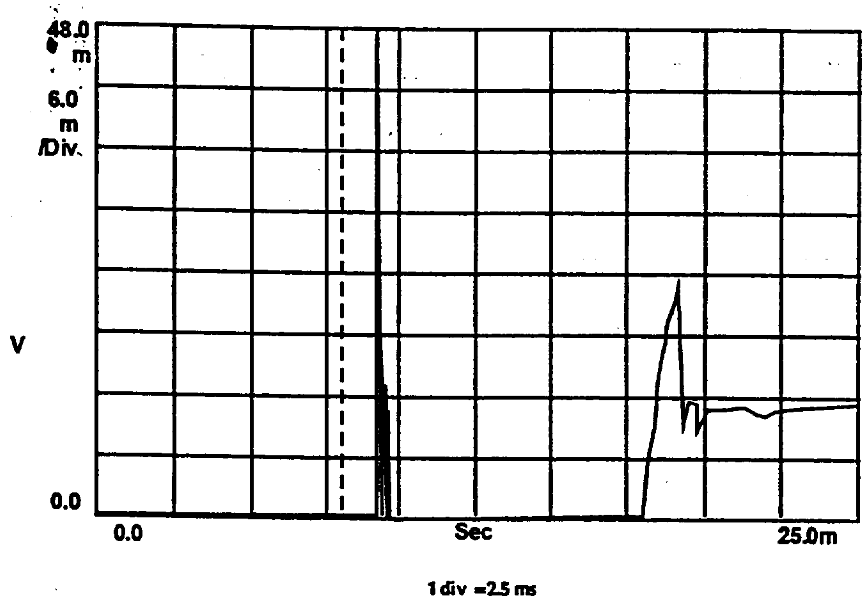
   The most probable location of the greatest current demand is during the first positive transition after voltage application. If this is the case, expand the segment of the display and measure the greatest voltage transition in the smallest time transition. The change in voltage times the current/div as selected on the current amplifier produces the change in current. Next divide this change in current by the change in time (in microseconds). This value is dI/dT. Example:

   Change in voltage .... 144 mV
   Change in time (microseconds) .... 19.5 µs
   Current/div on current amplifier .... 200 mA/ 10 mV

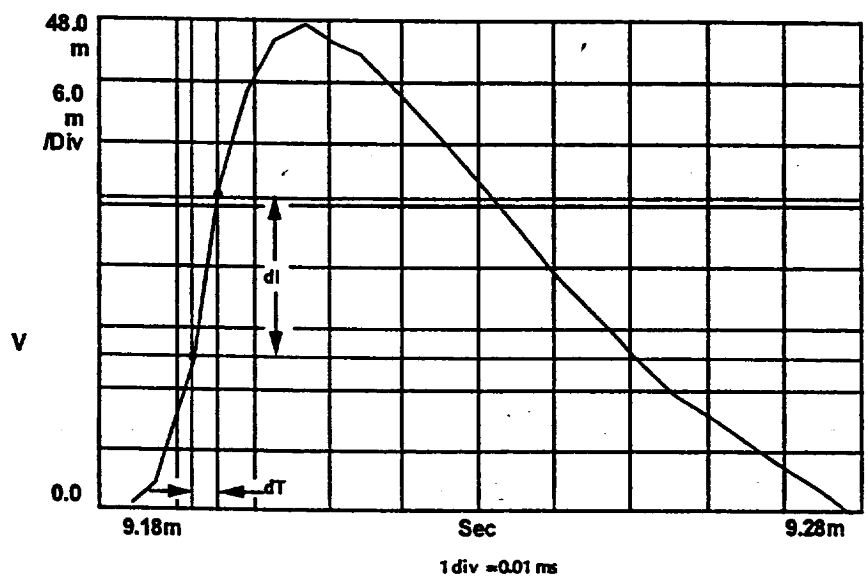
   144 mV x (200 mA/ 10 mV)/19.5 µs = 147.7 mA/ µs

10. Record the computed value on TDS 4.

3.2.4.2.2.8 ***Instrument feedback test.*** The instrument feedback test is performed in accordance with AE-26151/5. (See Table II.)



AMSU-A2 Pulse Load Bus Turn-on Transient



AMSU-A2 Pulse Load Bus $\frac{dI}{dT}$

Figure 10. Example of +28V Pulse Load Bus Turn-on Transient

3.2.4.2.2.9 ***Transient susceptibility and power quality tests.*** The tests that follow will demonstrate the AMSU-A2 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines.

3.2.4.2.2.9.1 ***Equipment setup.*** Set up the test equipment and connect to the instrument as shown in Figure 11.

3.2.4.2.2.9.2 ***Low frequency load induced transients.*** The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the Pulse Load Bus power line at the amplitude and duration specified in Figure 12. Perform the Low Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. Place the signal generator in ARB 1 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 12.

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.

8. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

3.2.4.2.2.9.3 ***High frequency load induced transients.*** The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

Perform the High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.

2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:

amplitude	200 mVpp
offset	0.000 V
frequency	1.430 Hz

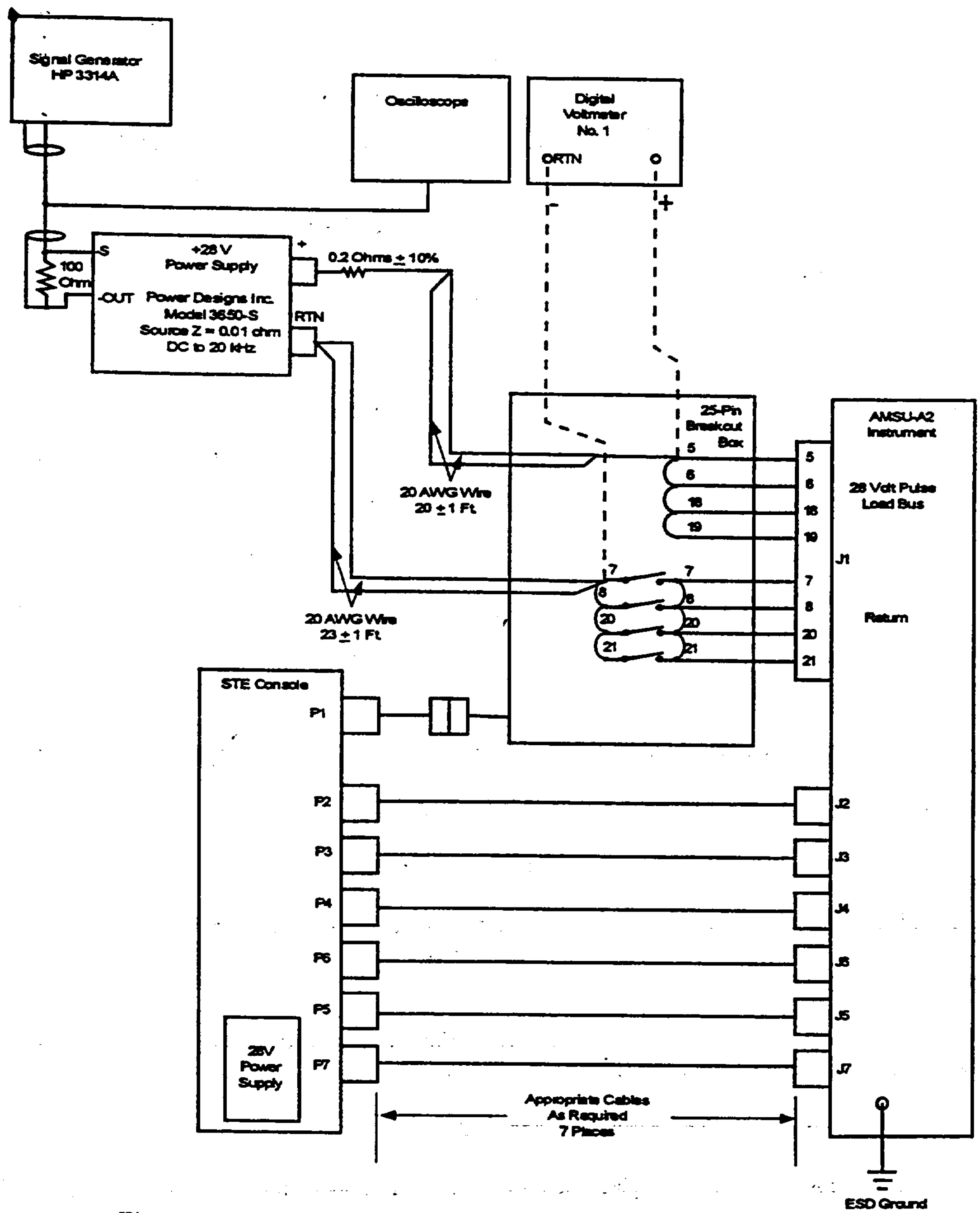


Figure 11. +28V PLB Transient Susceptibility and Power Quality Tests Setup

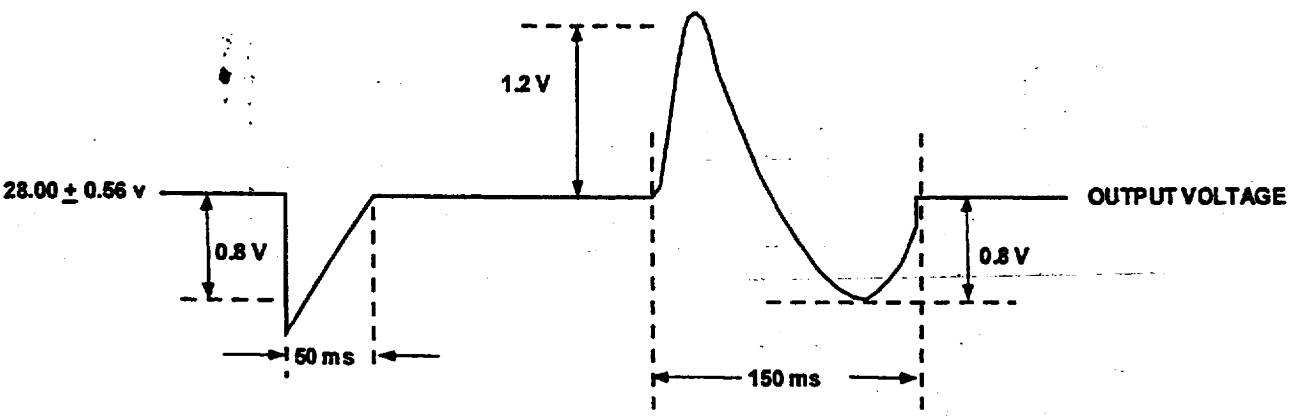


Figure 12. Load Induced Transient (Pulse Load)

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

8. Repeat steps 2 through 4, and 6 through 7 for 2.86 Hz and 1.0 Vpp.

9. Repeat steps 2 through 4, and 6 through 7 for 6.67 Hz and 1.5 Vpp.

10. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

3.2.4.2.3 *Analog telemetry bus*

3.2.4.2.3.1 *Operating power measurements* The purpose of this test is to calculate the operating power of the Analog Telemetry Bus from measurements taken of the bus voltage and current.

1. Configure the instrument as shown in Figure 13.

2. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

3. Measure the bus current and record on TDS 5.

4. From the measurements recorded on TDS 5, calculate the operating power for the telemetry bus and record on TDS 5.

3.2.4.2.3.2 *Instrument feedback test* The instrument feedback test is performed in accordance with AE-26151/5. (See Table II.)

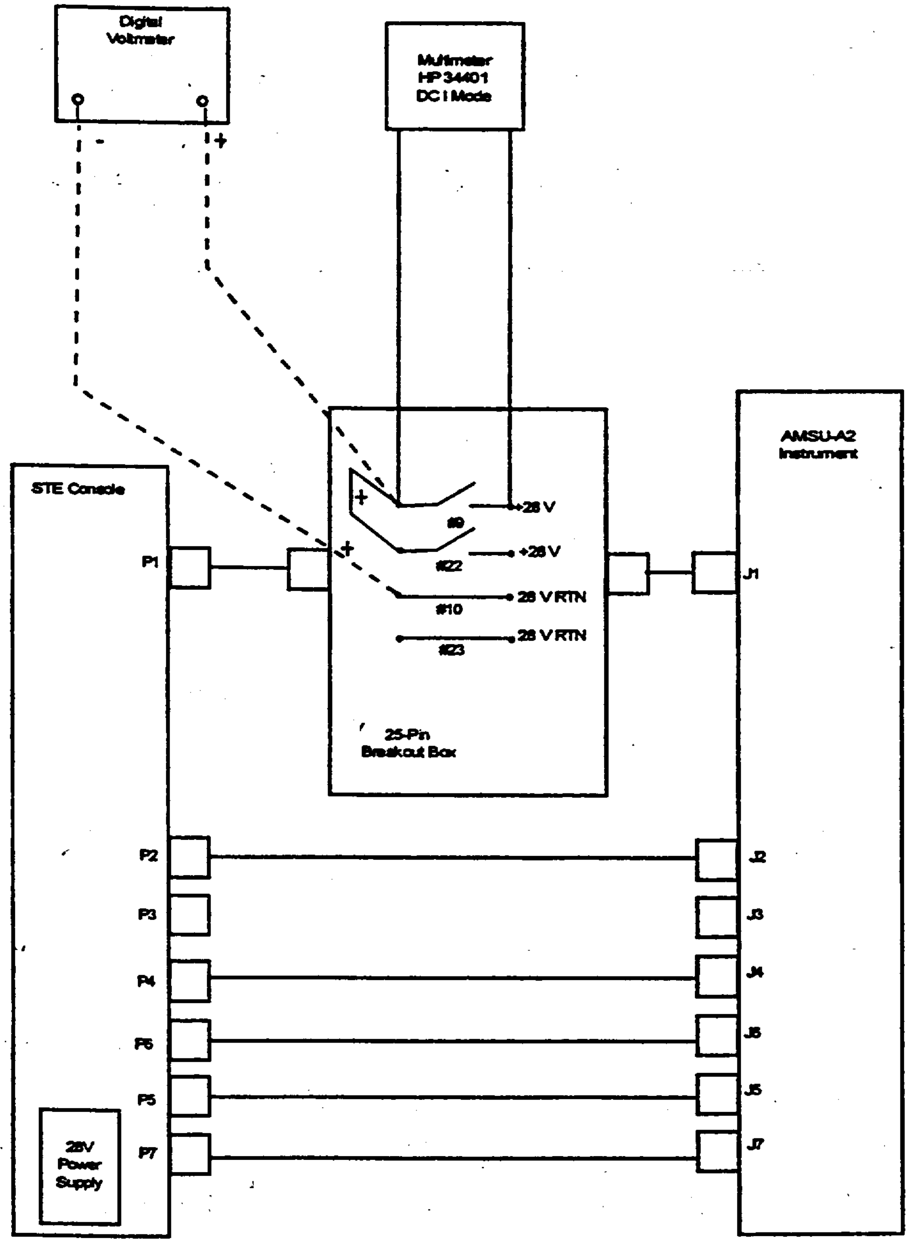


Figure 13. +28V Analog Telemetry Bus Test Setup

X 3.2.4.2.3.3 ***Transient susceptibility and power quality tests.*** The tests that follow will demonstrate the AMSU-A2 instrument will operate within specified parameters when the transients (low and high frequency) are applied directly to the power lines.

X 3.2.4.2.3.3.1 ***Equipment setup.*** Set up the test equipment and connect to the instrument as shown in Figure 14 (exceptions: remove the current probe and amplifier; connect the oscilloscope to monitor output of the signal generator).

|X 3.2.4.2.3.3.2 ***Low frequency load induced transients.*** The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the power line at the amplitude and duration specified in Figure 15. Perform the Low Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.
2. Place the signal generator in ARB 0 mode. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator to attain the signal characteristics as shown in Figure 15.
3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.
4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.
5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.
6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.
7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21. Attach printouts to TDS 41.
8. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

|X 3.2.4.2.3.3.3 ***High frequency load induced transients.*** The AMSU instrument shall be capable of normal operation before and after the injection of positive and negative transients into the power line. The interfering frequencies are simulated by using the triangular wave output of the signal generator. There are three signals to be sequentially injected; the frequencies and amplitudes as produced by the signal generator and measured by the oscilloscope are:

Frequency (Hz)	Amplitude
1.43	200 mVpp
2.86	1.00 Vpp
6.67	1.50 Vpp

Perform the High Frequency Load Induced Transients as follows:

1. With the exception of the external power supply, turn ON all the test equipment.
2. With the external power supply OFF, while monitoring the oscilloscope, adjust the amplitude and frequency output of the signal generator output as follows:

amplitude	200 mVpp
offset	0.000 V
frequency	1.430 Hz

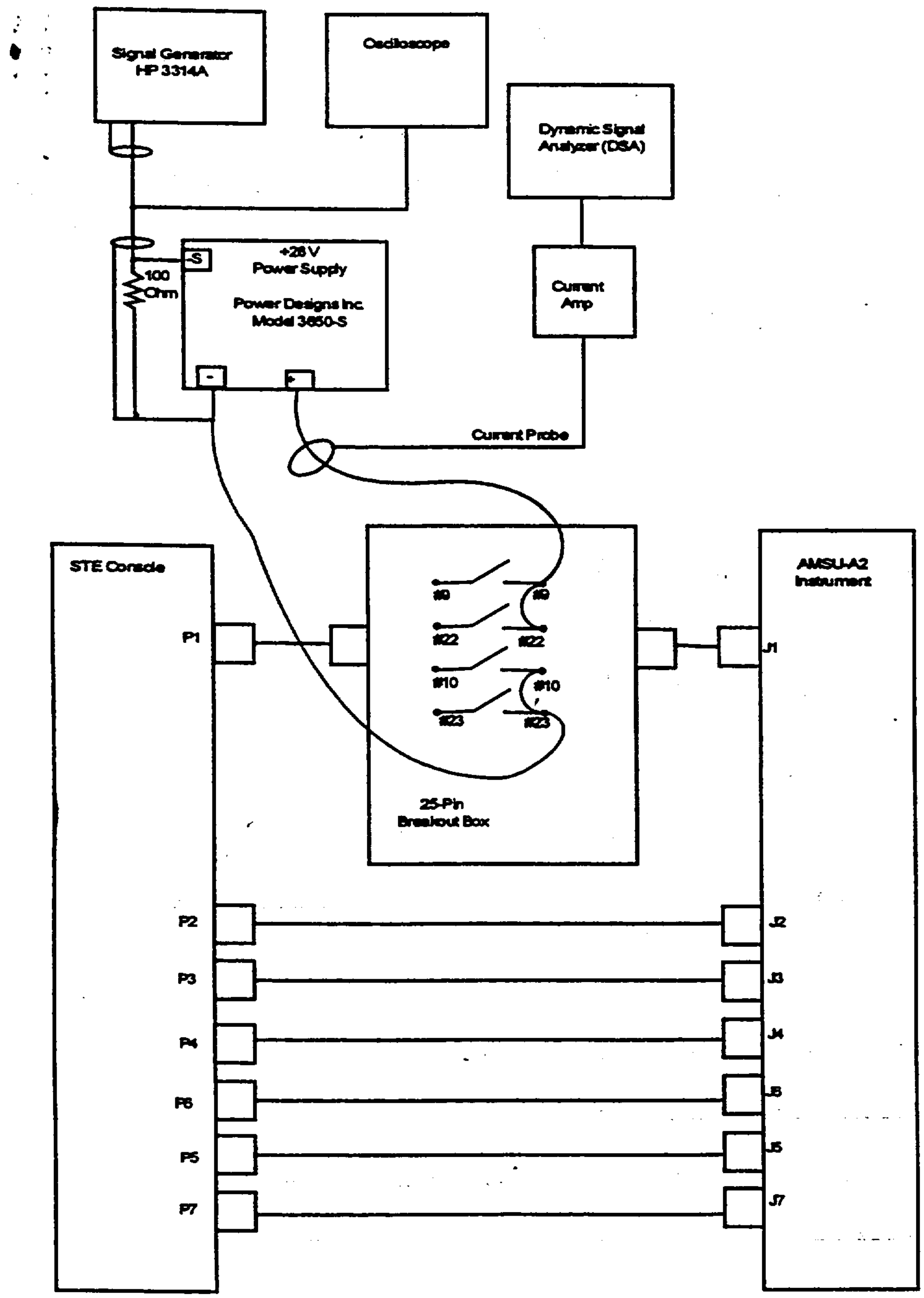
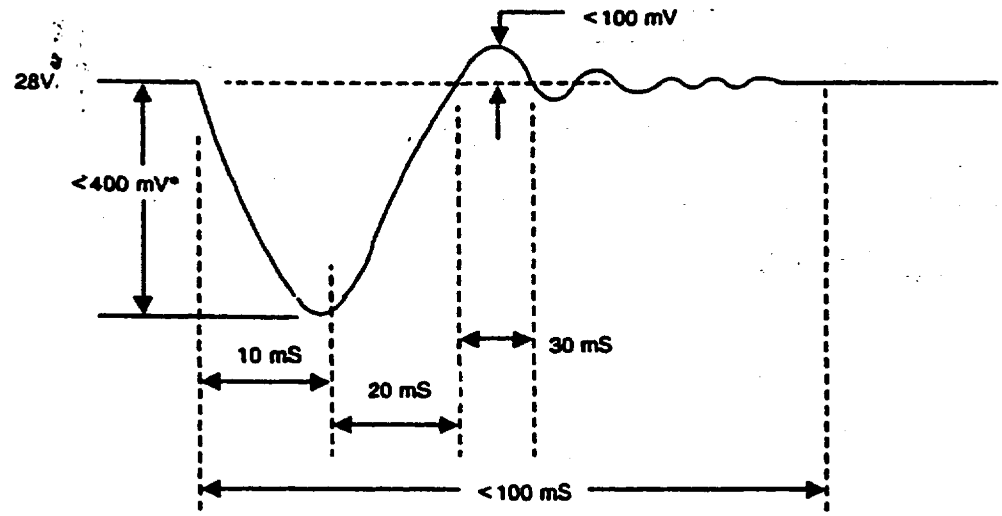


Figure 14. +28 Vdc Analog Telemetry Bus Ripple Current and Transient Susceptibility Test Setup



* Typical transients occurring a number of times per orbit are on the order of 200 mV zero-to-peak for a 1.5A load change.

Figure 15. Load Induced Transient (Main Bus)

3. Remove the signal generator output connection from the power supply. While monitoring the external power supply dc voltage with the meter, turn the external power supply ON.

4. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

5. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

6. Connect the signal generator to the external power supply. Wait for the instrument to complete three scans. Remove the signal generator output to the power supply.

7. Acquire one Full Scan Mode printout; verify the printout meets the requirements of TDS 18 thru 21.

8. Repeat steps 2 through 4, and 6 through 7 for 2.86 Hz and 1.0 Vpp.

9. Repeat steps 2 through 4, and 6 through 7 for 6.67 Hz and 1.5 Vpp.

10. Record any deviations in the functional performance of the AMSU instrument on TDS 41.

3.2.4.2.4 ***+10 Vdc interface bus test***

3.2.4.2.4.1 ***Operating power measurements*** The purpose of this test is to calculate the operating power of the +10 Vdc Interface Bus from measurements taken of the bus voltage and current.

1. Configure the instrument as shown in Figure 16.

2. Turn the instrument ON and place the instrument in the modes congruent with paragraph 3.2.3.5.

3. Measure the bus current and record on TDS 6.

4. From the measurements recorded on TDS 6, calculate the operating power for the telemetry bus and record on TDS 6.

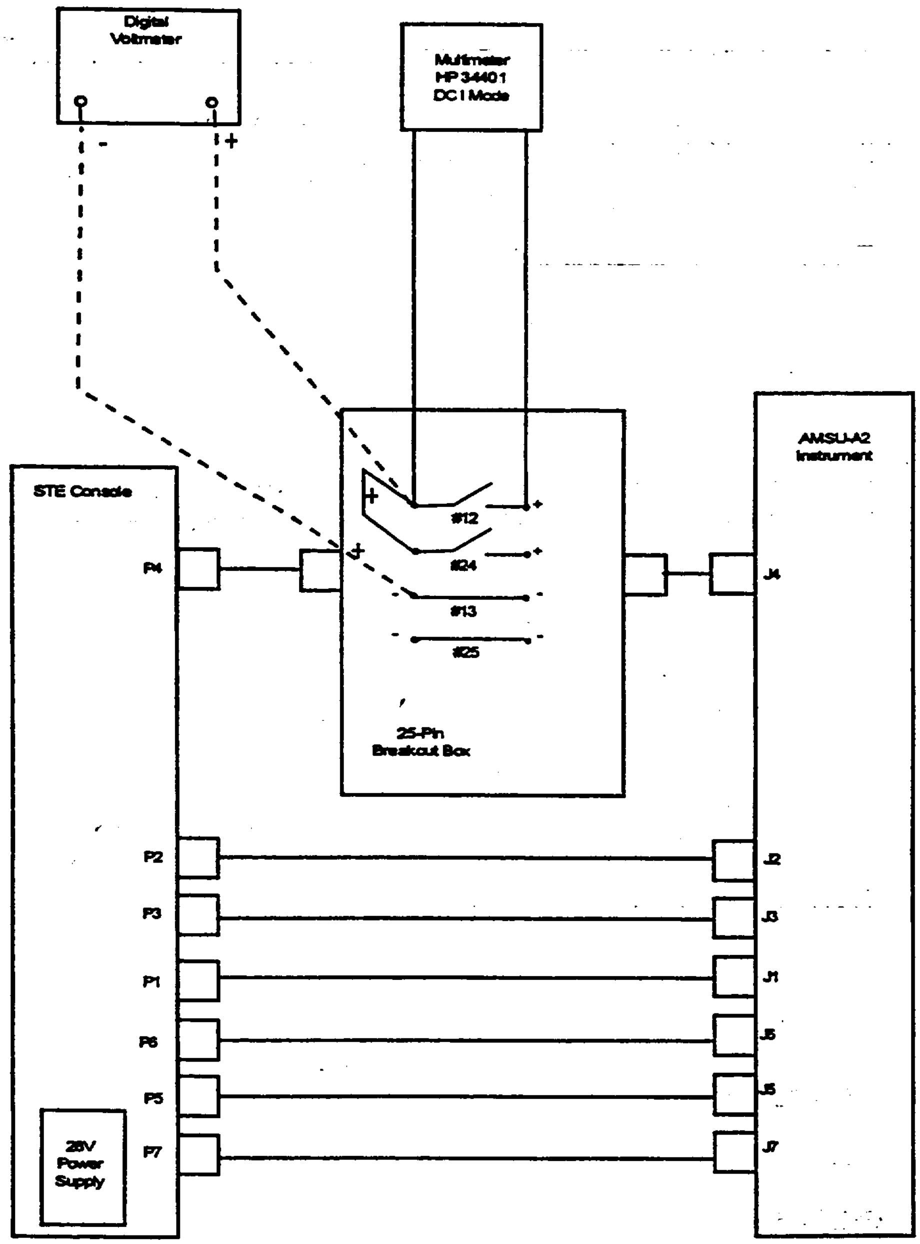


Figure 16. +10V Interface Bus Test Setup

3.2.4.2.4.2 ***Instrument feedback test*** The instrument feedback test is performed in accordance with AE-26151/5. (See Table II.)

3.2.4.2.5 ***Power input test for LPT.*** For LPT, test the power input as follows:

1. Configure the unit and test equipment as indicated in Figure 17.

2. Turn the unit ON as described in 3.2.3.5.

NOTE

Do not proceed without successful completion of step 2.

3. Adjust the STE power supply such that the voltmeter across J1-1 and J1-3 reads +28.0 ± 0.5 V. Record the voltage across the pin J1-1 and J1-3 and record the current at STE power supply on TDS B-1, Appendix B (LPT).

4. Turn off power by referring to 3.2.3.6.

3.2.4.3 ***Clock, commands, and data system test.*** This procedure verifies the clock signal, the commands, and the data requirements specified in S-480-80, GIIS IS-3267415, and UIIS IS-2624483.

3.2.4.3.1 ***Test sequence.*** The test sequence shall be as follows:

a. Clock signals verification

b. Commands and Digital-B telemetry verification

c. Data output verification

- Digital-A
- Analog telemetry
- Test points

d. GSE modes.

3.2.4.3.2 ***Clock signals test.*** The following items shall be tested to verify the clock signals. Refer to Figures 18 and 19 for graphical representation of these pulses.

a. 1.248 MHz clock

b. 8 seconds frame pulse

c. A1 select pulse

d. C1 shift pulse

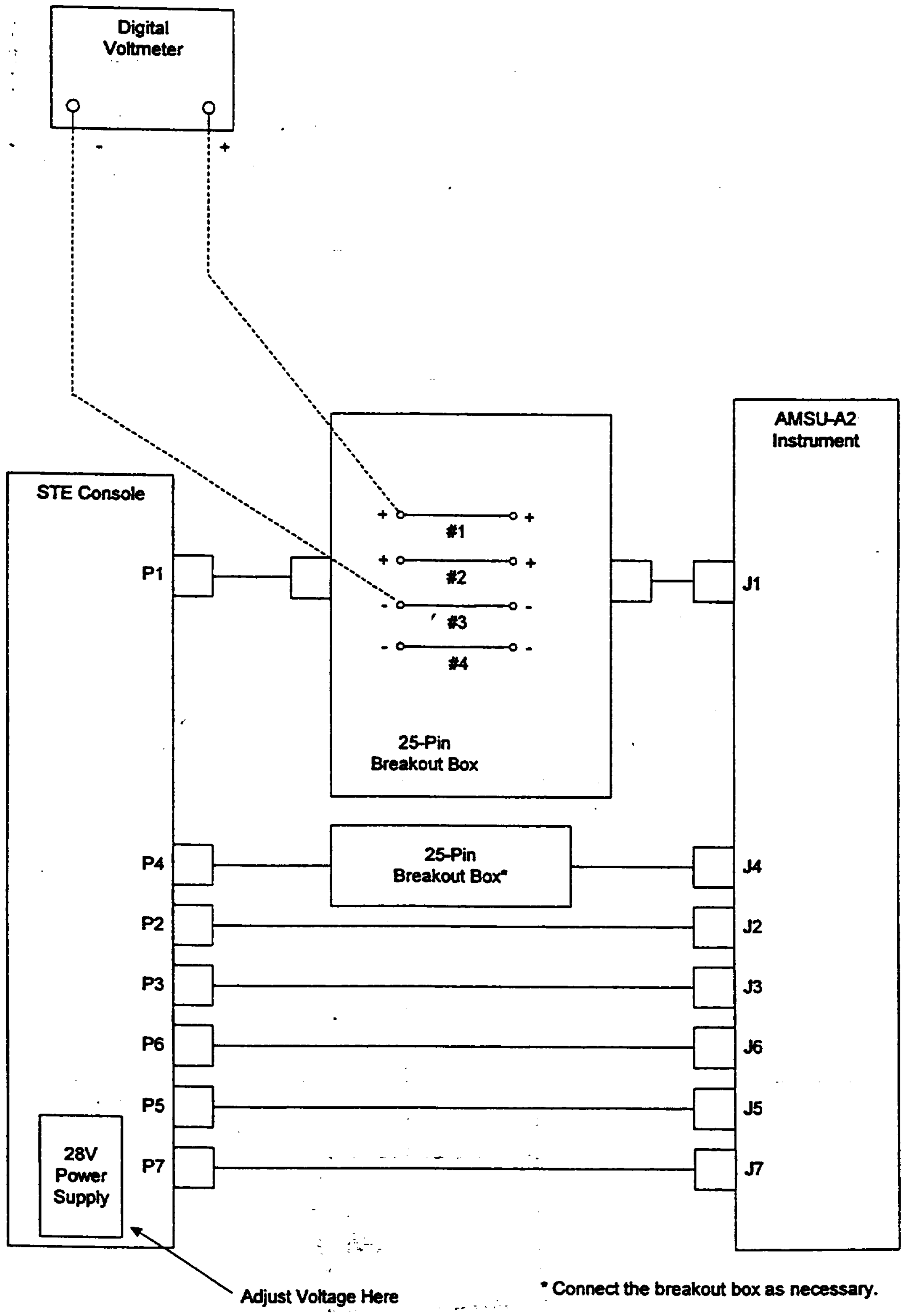


Figure 17. +28 V Main Load Bus Test Setup (For LPT Only)

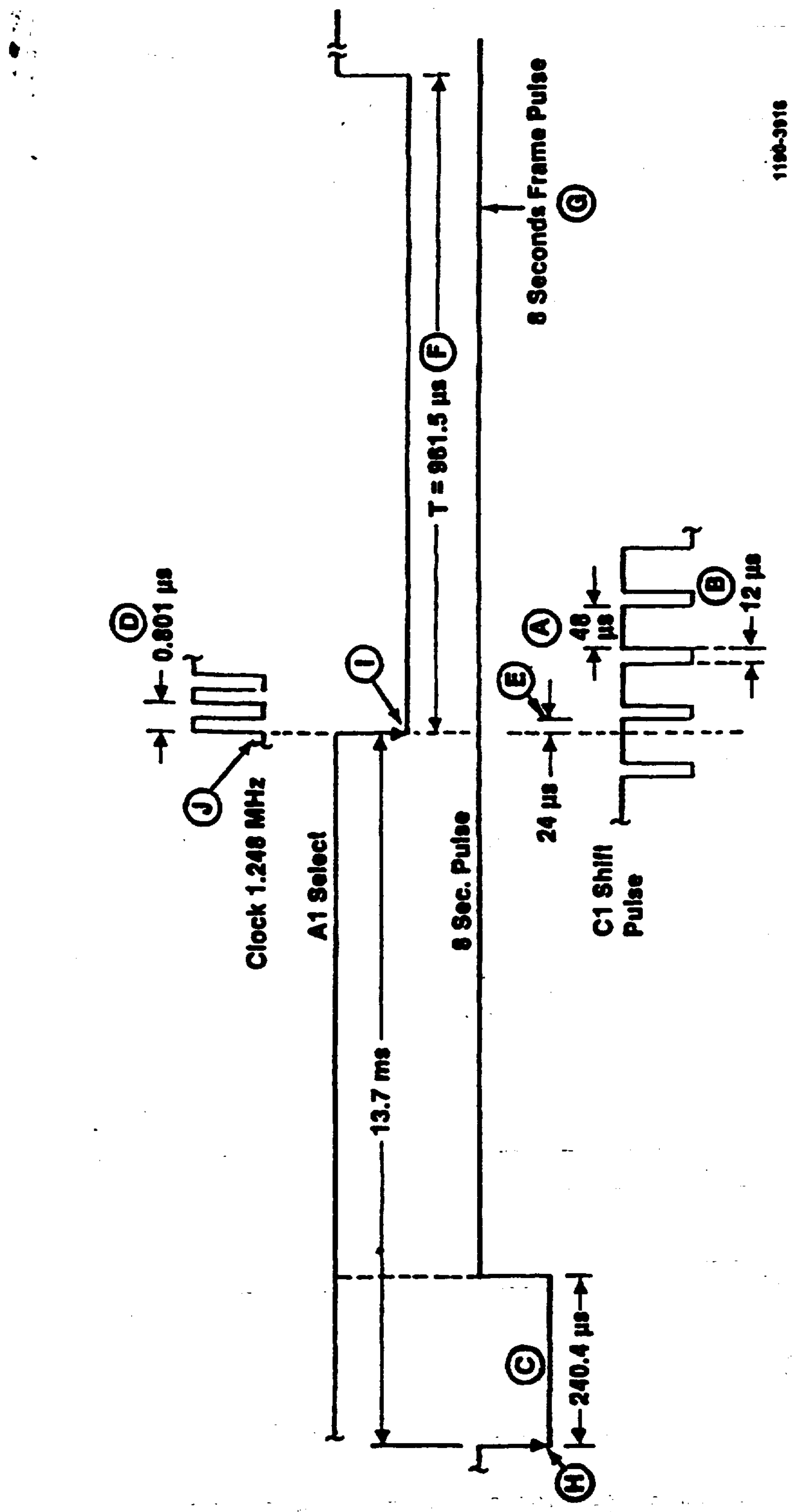


Figure 18. Clock Pulses Timing and Synchronization

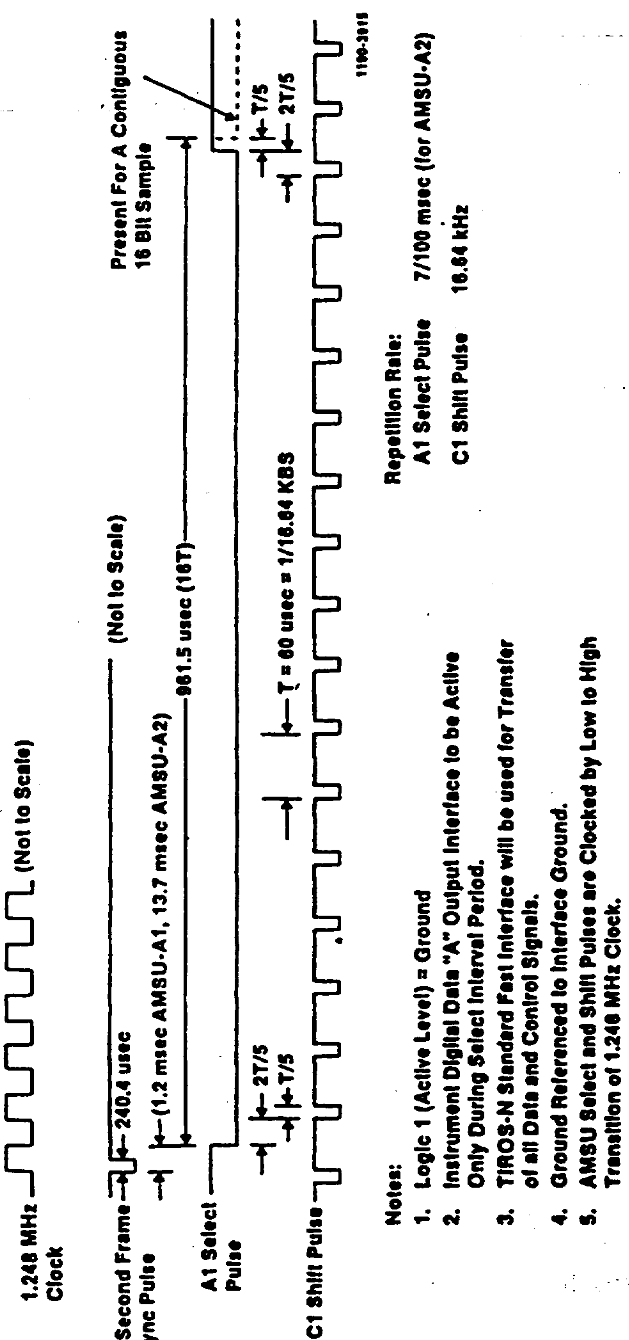


Figure 19. Synchronization Interface Signals

3.2.4.3.2.1 ***1.248 MHz synchronization clock.*** Perform the following procedures.

1. Configure the unit and the test equipment as indicated in Figure 20.

2. Connect CHANNEL-1 of the oscilloscope to the 1.248 MHz clock signal of the STE output (instrument input) as shown in Figure 20.

3. Turn the unit ON as described in 3.2.3.5.

NOTE

Do not proceed without successful completion of step 3.

4. Using the oscilloscope, measure the 1.248 MHz clock signal. Record the data and attach the photograph or plot on TDS 7.

3.2.4.3.2.2 ***C1 shift pulse verification.*** Connect CHANNEL-2 of the oscilloscope to Pin 2 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 8.

3.2.4.3.2.3 ***A1 select pulse verification.*** Connect CHANNEL-2 of the oscilloscope to Pin 6 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 9.

3.2.4.3.2.4 ***8-seconds frame sync pulse verification.*** Perform the following procedures.

1. Connect CHANNEL-2 of the oscilloscope to Pin 7 of the 9-pin breakout box (P2-J2). Photograph or plot the oscilloscope display and record the information indicated on TDS 10. Measure pulse repetition timing by using HP5316A Universal counter and record on TDS 10.

2. Turn the unit OFF by executing the softkey command [11] MODULE TOTALLY OFF. Leave both breakout boxes in place.

3. Turn off power by referring to 3.2.3.6.

3.2.4.3.2.5 ***Synchronization signal relationship.*** The following synchronization signal relationship shall be verified.

a. A1 select pulse and the 8-second frame sync pulse

b. A1 select pulse and C1 shift pulse

c. A1 select pulse and 1.248 MHz clock.

Relationship of A1 select pulse and the 8-second frame sync pulse:

1. With the unit off, configure the unit and the test equipment as indicated in Figure 21.

2. Connect CHANNEL-1 of the oscilloscope to the breakout box, Pin 7 (8 second frame pulse).

3. Turn the unit ON as described in 3.2.3.5.

NOTE

Do not proceed without successful completion of step 3.

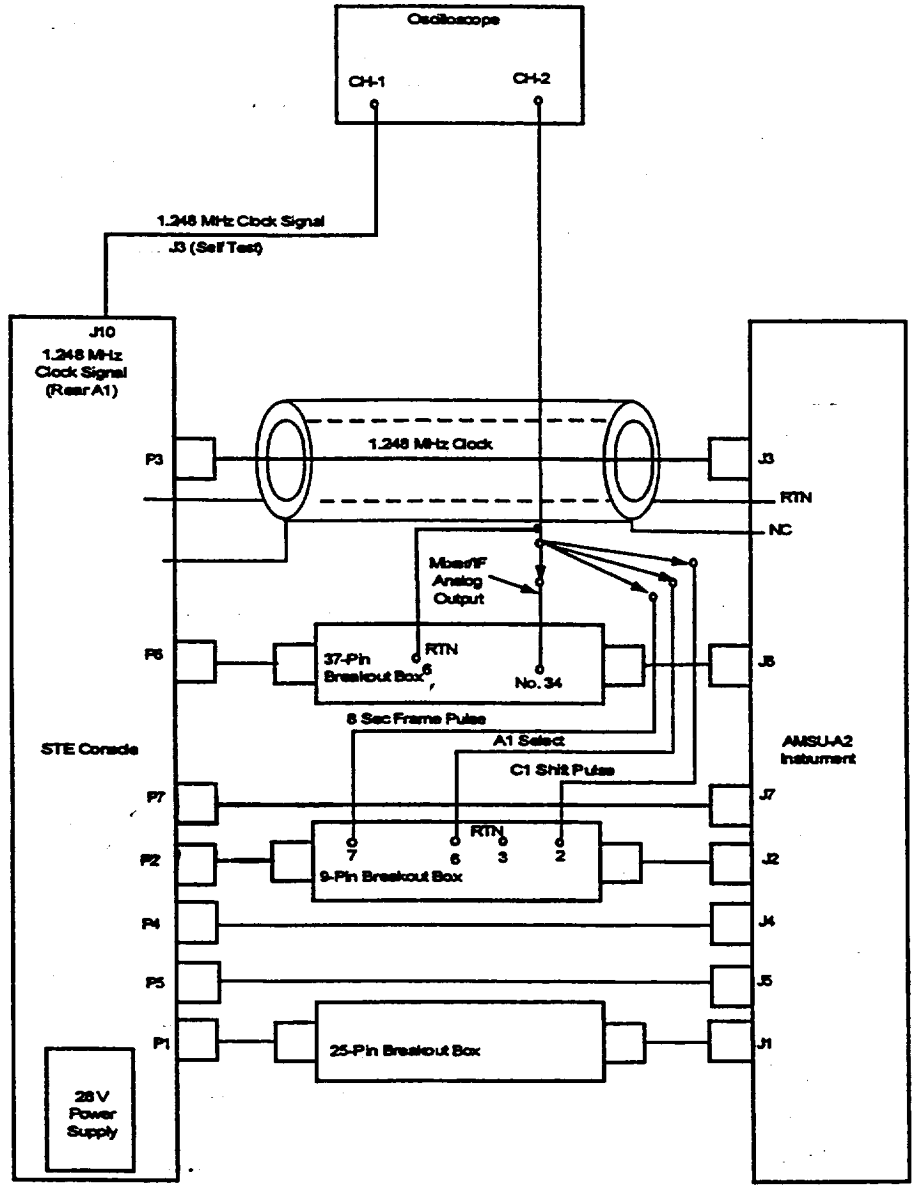


Figure 20. Clock Signal and DC/DC Converter Synchronization Test Setup

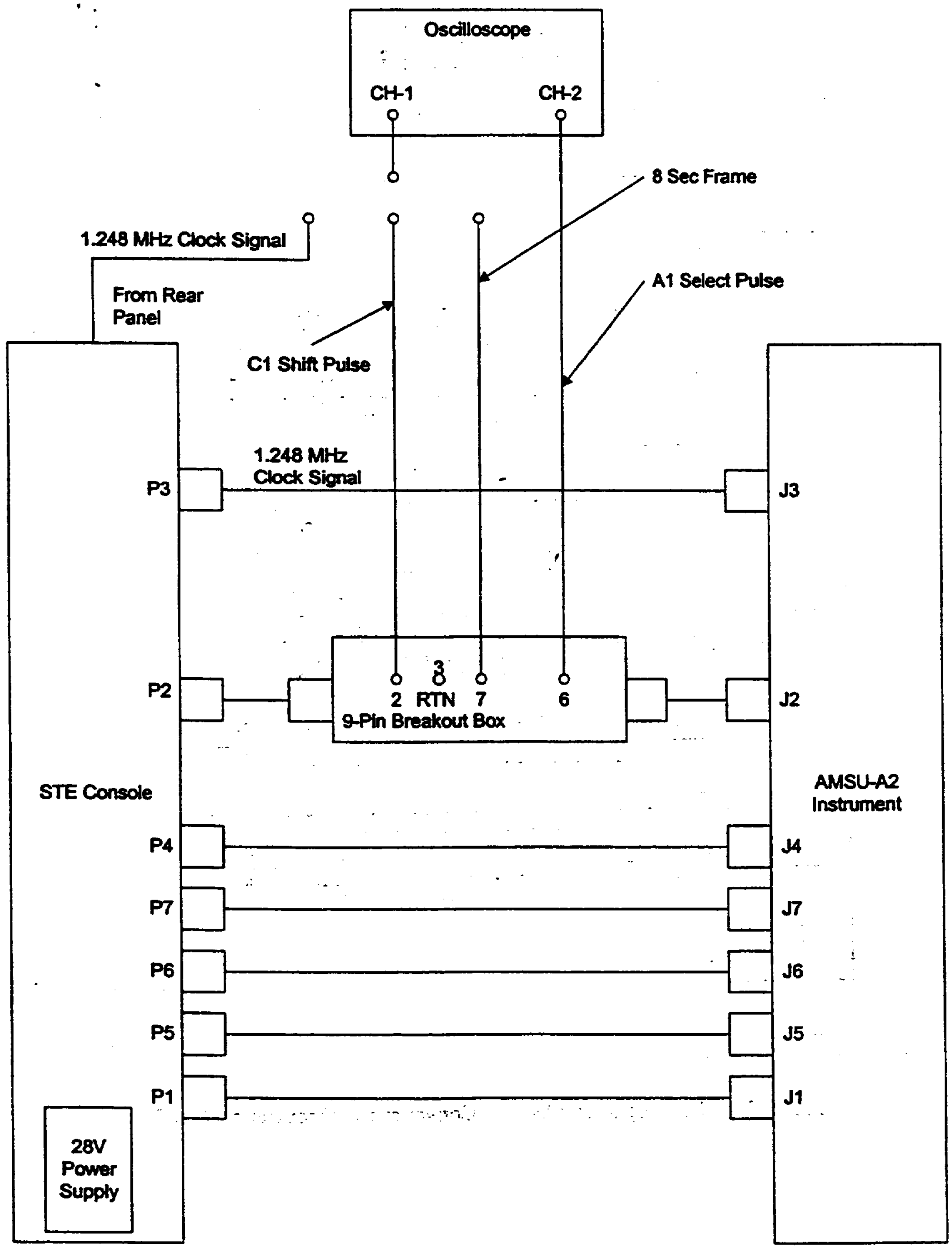


Figure 21. Synchronization Signal Relationships Test Setup

4. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

5. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 11, sheet 1.

6. From the photograph or plot, verify the synchronization as described in TDS 11, sheet 1. Record pass or fail.

Relationship of A1 select pulse and C1 shift pulse:

7. Connect CHANNEL-1 of the oscilloscope to the breakout box Pin 2 (C1 shift pulse).

8. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

9. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 11, sheet 2.

10. From the photograph or plot, verify the synchronization as described in TDS 11, sheet 2. Record pass or fail.

Relationship of A1 select pulse and the 1.248 clock pulse:

11. Connect CHANNEL-1 of the oscilloscope to the clock connector located at the rear of the STE (J10 of SELF TEST).

12. Adjust the amplitude and the trigger level of the oscilloscope for best picture.

13. Photograph or plot the oscilloscope display and attach the photograph or plot in the space provided on TDS 12.

14. From the photograph or plot, verify the synchronization as described in TDS 12. Record pass or fail.

15. Turn off the instrument by executing command [11] MODULE TOTALLY OFF.

16. Turn off the +28 V STE power supply.

17. Connect unit to STE as shown in Figure 20 without breakout boxes and test equipment.

3.2.4.3.3 ***Commands and digital-B telemetry test.*** Commands and digital-B telemetry shall be verified in accordance with the following paragraphs.

3.2.4.3.3.1 ***Module totally off.*** Commands and digital-B telemetry, with the module totally off, shall be tested as follows:

1. Turn the unit ON as described in 3.2.3.5.

NOTE

Do not proceed without successful completion of step 1.

2. From the Commands Menu, execute command [11] MODULE TOTALLY OFF to OFF mode.

3. Wait at least 18 seconds, then verify that the following events are in effect:

a. [11] MODULE TOTALLY OFF = OFF

b. [12] SCANNER A2 POWER = OFF

c. [10] SURVIVAL HTR POWER = OFF

d. Antenna reflector pointing toward the warm load.

4. Record the above observations on TDS 13 (Appendix B, TDS B-2 for LPT).

3.2.4.3.3.2 ***Survival heater power ON/OFF command.*** The survival heater power ON/OFF command shall be tested as follows:

1. Execute command [10] SURVIVAL HEATER POWER to ON mode.

2. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 13 (Appendix B, TDS B-2 for LPT).

3. Execute command [10] SURVIVAL HEATER to OFF mode.

4. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 13 (Appendix B, TDS B-2 for LPT).

3.2.4.3.3.3 ***Module power connect command.*** The module power connect command shall be tested as follows:

1. Execute command [9] MODULE POWER to CONNECT mode.

2. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 13 (Appendix B, TDS B-2 for LPT).

3. Verify that the current at the STE power supply is 0.5 to 3.2 Amperes. Record this information on TDS 13 (Appendix B, TDS B-2 for LPT).

3.2.4.3.3.4 ***Scanner commands verification.*** The scanner commands shall be tested as follows:

1. Execute commands as necessary to obtain the following configuration:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 14 (Appendix B, TDS B-3 for LPT).

2. Execute. [12] SCANNER A2 POWER = OFF
[13] COMPENSATOR MOTOR POWER = OFF

Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 15 (Appendix B, TDS B-4 for LPT).

3. Execute. [12] SCANNER A2 POWER = ON
[13] COMPENSATOR MOTOR POWER = ON

Wait at least 18 seconds. Verify that the commands are in effect. Record observations on TDS 16 (Appendix B, TDS B-5 for LPT).

3.2.4.3.3.5 ***Scanner position commands verification***. Verify scanner position command operation as follows:

1. Execute command [14] ANTENNA WARM CAL POS to YES mode.

2. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

3. Execute commands [15] ANTENNA IN COLD CAL POS to YES mode, [18] COLD CAL POSITION MSB to 0, and [19] COLD CAL POSITION LSB to 1.

4. Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

5. Execute commands [18] COLD CAL POSITION MSB to 1 and [19] COLD CAL POSITION LSB to 0.

6. Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

7. Execute commands [18] COLD CAL POSITION MSB to 1 and [19] COLD CAL POSITION LSB to 1.

8. Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

9. Execute commands [18] COLD CAL POSITION MSB to 0 and [19] COLD CAL POSITION LSB to 0.

10. Wait at least 18 seconds. Verify that the commands are in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

11. Execute command [16] ANTENNA IN NADIR POSITION to YES mode.

12. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

13. Execute command [14] ANTENNA WARM CAL POS to YES mode.

14. Wait at least 18 seconds. Verify that the command is in effect. Record observation on TDS 17 (Appendix B, TDS B-6 for LPT).

3.2.4.3.4 ***Digital-A data output test***. The following items shall be tested to verify the digital-A data output:

a. Full scan (3.2.4.3.4.1)

b. Warm load (3.2.4.3.4.2)

c. Cold cal (3.2.4.3.4.3)

d. Nadir (3.2.4.3.4.4).

For each of the above scan modes, the following parameters will be subject to pass/fail criterion:

[I] Sync. sequence

[II] Unit I.D. and serial number

[III] Digital B serial data verification

[IV] Reflector positions

[V] Radiometric data (scene data)

[VI] Temperature sensors.

For the cold cal mode, reflector position [IV] shall be tested for the following conditions.

(a) Cold cal position with MSB=1 and LSB=0

(b) Cold cal position with MSB=0 and LSB=1

(c) Cold cal position with MSB=1 and LSB=1.

3.2.4.3.4.1 ***Full scan mode.*** The digital-A data output in full-scan mode shall be tested as follows:

1. Execute commands as necessary to obtain the following configuration:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

2. Obtain a full printout of all the parameters ([I] through [VI]) described above, by typing PRINT [3] FULL.

3. Attach the printout to TDS 18 (Appendix B, TDS B-7 for LPT).

[I], [II], and [III] Sync, Unit ID, and Digital-B Data:

4. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 18 (Appendix B, TDS B-7 for LPT). Record pass or fail.

[IV] Reflector position:

5. Using STE procedure AE-26157; select reflector position screen, execute PRINT [2] SCREEN ONLY, and attach the data to TDS 19 (Appendix B, TDS B-8 for LPT). Verify that there is no "E" error on computer printout. Record pass or fail on TDS 19 (Appendix B, TDS B-8 for LPT).

[V] Radiometric data:

6. Using STE procedure AE-26157, select Radiometric data for CH-1 and CH-2. PRINT SINGLE [2] PAGES for each channel. From the data obtained, verify that the data are within the values specified on TDS 20. Attach the data for each channel to TDS 20 (Appendix B, TDS B-9 for LPT). Record pass or fail.

[VI] Temperature sensors:

7. Using STE procedure AE-26157, select DIG-A temperature sensor screen and PRINT SINGLE [2] PAGE. From the data obtained, verify that the values are within the specified limits on TDS 21 (Appendix B, TDS B-10 for LPT). Attach the data to TDS 21 (Appendix B, TDS B-10 for LPT). Record pass or fail.

3.2.4.3.4.2 ***Warm cal mode.*** The digital-A data output, in warm-cal mode shall be tested as follows:

1. Execute command [14] ANTENNA WARM CAL POS and verify command display is as follows:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	YES			
POWER [4] ON					

2. Obtain a full printout of all the parameters ([I] through [VI]) described above, by touching the PRINT [3] FULL touch area.

3. Attach the printout to TDS 22.

[I], [II], and [III] Sync, Unit ID, and Digital-B Data:

4. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 22. Record pass or fail.

[IV] Reflector position:

5. Using STE procedure AE-26157; select reflector position screen, execute PRINT [2] SCREEN ONLY, and attach the data to TDS 23. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 23.

[V] Radiometric data:

6. Using STE procedure AE-26157, select Radiometric data for channel 1 and channel 2. PRINT [2] SINGLE PAGES for each channel. From the data obtained, verify that the data are within the values specified on TDS 24. Attach the data for each channel to TDS 24. Record pass or fail.

[VI] Temperature sensors:

7. Using STE procedure AE-26157, select DIG-A temperature sensor screen and PRINT SINGLE [2] PAGE. From the data obtained, verify that the values are within the specified limits on TDS 25. Attach the data to TDS 25. Record pass or fail.

3.2.4.3.4.3 ***Cold cal mode.*** The digital-A data output, in cold-cal mode, shall be tested as follows:

1. Execute command [15] ANTENNA IN COLD CAL POS and verify command display is as follows:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	YES	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

2. Obtain a full printout of all the parameters ([I] through [VI]) described above, by touching the PRINT [3] FULL touch area.

3. Attach the printout to TDS 26.

[I], [II], and [III] Sync, Unit ID, and Digital-B Data:

4. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 26. Record pass or fail.

[IV] Reflector position:

5. To test the cold cal reflector position, perform the following substeps:

   (a) Using STE procedure AE-26157; select reflector position screen, execute PRINT [2] SCREEN ONLY, and attach the data to TDS 23. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 23.

   (b) Execute commands [18] COLD CAL POSITION MSB to 0 and [19] COLD CAL POSITION LSB to 1. Repeat substep a. then proceed to substep c.

   (c) Execute commands [18] COLD CAL POSITION MSB to 1 and [19] COLD CAL POSITION LSB to 0. Repeat substep a., then proceed to substep d.

   (d) Execute commands [18] COLD CAL POSITION MSB to 1 and [19] COLD CAL POSITION LSB to 1. Repeat substep a., then proceed to substep e.

   (e) Execute commands [18] COLD CAL POSITION MSB to 0 and [19] COLD CAL POSITION LSB to 0.

[V] Radiometric data:

6. Using STE procedure AE-26157, select Radiometric data for channel 1 and channel 2. PRINT [2] SINGLE PAGES for each channel. From the data obtained, verify that the data are within the values specified on TDS 27. Attach the data for each channel to TDS 27. Record pass or fail.

[VI] Temperature sensors:

7. Using STE procedure AE-26157, select DIG-A temperature sensor screen and PRINT SINGLE [2] PAGE. From the data obtained, verify that the values are within the specified limits on TDS 28. Attach the data to

TDS 28. Record pass or fail.

3.2.4.3.4.4 *Nadir cal mode.* The digital-A data output, in nadir-cal mode, shall be tested as follows:

1. Execute command [16] ANTENNA IN NADIR POS and verify command display is as follows:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	YES	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

2. Obtain a full printout of all the parameters ([I] through [VI]) described above, by touching the PRINT [3] FULL touch area.

3. Attach the printout to TDS 29.

[I], [II], and [III] Sync, Unit ID, and Digital-B Data:

4. Using Page 1 of the printout, verify that elements 0001 through 0008 are within the required values specified in TDS 29. Record pass or fail.

[IV] Reflector position:

5. Using STE procedure AE-26157; select reflector position screen, execute "PRINT [2] SCREEN ONLY", and attach the data to TDS 23. Verify that there is no "E" error on the computer printout. Record pass or fail on TDS 23.

[V] Radiometric data:

6. Using STE procedure AE-26157, select Radiometric data for channel 1 and channel 2. "PRINT [2] SINGLE PAGES" for each channel. From the data obtained, verify that the data are within the values specified on TDS 30. Attach the data for each channel to TDS 30. Record pass or fail.

[VI] Temperature sensors:

7. Using STE procedure AE-26157, select DIG-A temperature sensor screen and "PRINT SINGLE [2] PAGE". From the data obtained, verify that the values are within the specified limits on TDS 31. Attach the data to TDS 31. Record pass or fail.

3.2.4.3.5 *Analog telemetry test.* The purpose of this test is to verify that the 26 analog telemetry signals are within requirements. The purpose of the analog telemetry signals is to provide information about the functionality of the subsystems during normal operation of the unit. The analog telemetry signals shall be verified in two ways: (1) by measuring the analog telemetry signals directly at the interfacing connector and (2) by use of the STE.

3.2.4.3.5.1 *Analog TLM signals measurements connector J6.* Measure analog TLM signals at connector J6 as follows:

1. Configure the unit and the STE as indicated in Figure 22. Verify that unit power is off prior to the installation of the breakout boxes. To turn the unit off, select the Commands Menu and execute command

"[11] MODULE TOTALLY OFF". Manually turn off the STE 28V power supply located inside the STE console.

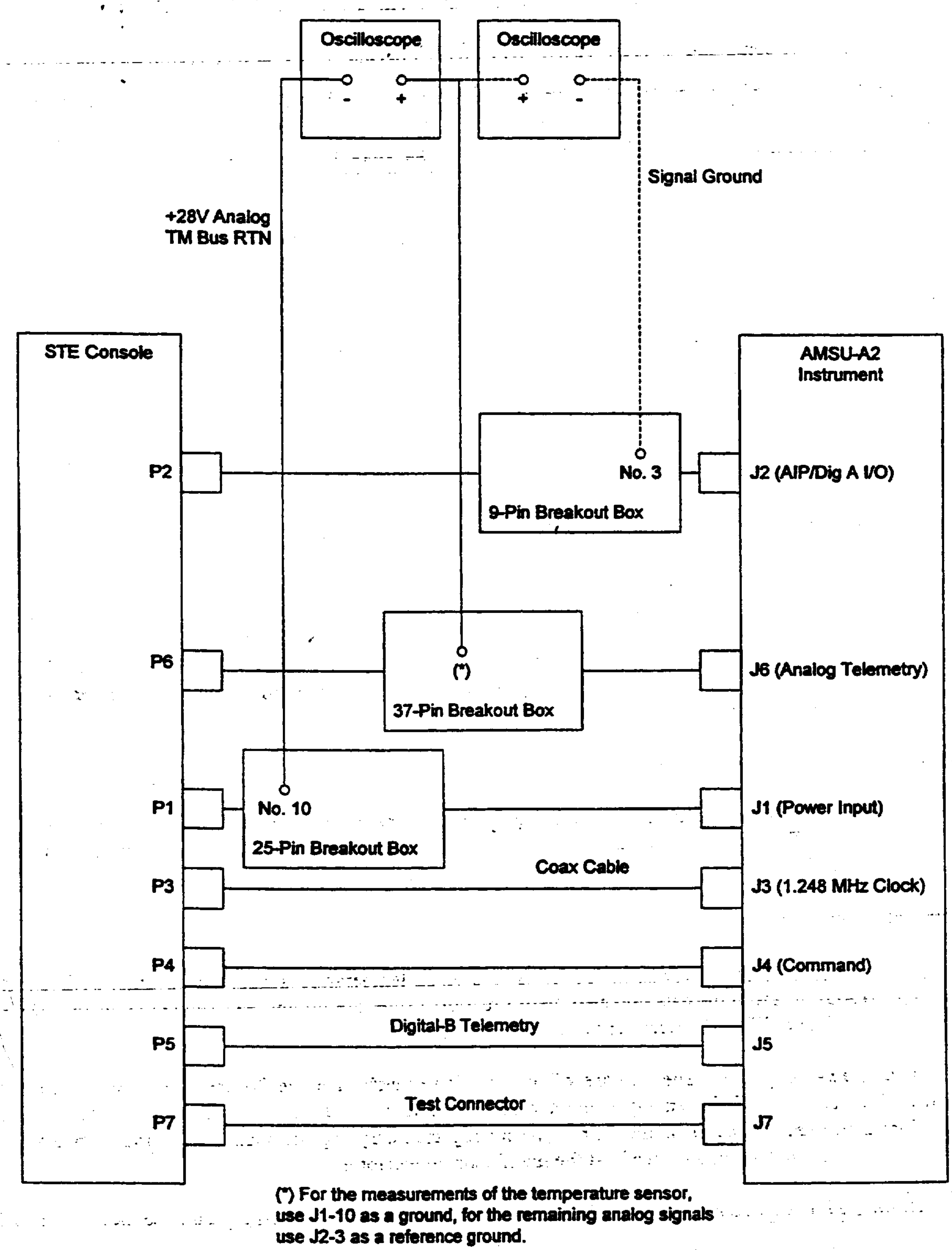


Figure 22. Analog Telemetry Signal Verification Test Setup

2. Turn the unit on as follows:

   (a) Turn on the STE 28V power supply.

   (b) Execute commands as necessary to achieve the following configuration:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	NO			
POWER [4] ON					

3. Using the "28V Analog Telemetry Bus Return" (J1-10) as a reference ground, measure and record the four temperature sensor voltages in the order specified on TDS 32.

4. Using the "Signal Ground" (J2-03) as a reference ground, measure and record the remaining analog telemetry voltage levels in the order specified on TDS 32.

5. Leave the unit on in preparation for the next test.

3.2.4.3.5.2 *Analog TLM signal measurements using the STE.* Analog TLM signal measurements using the STE shall be taken as follows:

1. Using STE procedure AE-26157, select Analog TLM screen and execute command "PRINT [2] SCREEN ONLY". Obtain printout and verify that the data matches the values specified on TDS 33 (Appendix B, TDS B-11 for LPT). Record pass or fail.

2. Attach computer printout to TDS 33 (Appendix B, TDS B-11 for LPT).

3. Power off unit by referring to 3.2.3.6.

3.2.4.3.6 *Test point test.* The purpose of this test is to verify the performance of the integrator and its associated clock pulses. Figure 2 shows the integration waveform and the clock signals. Test point verification consists of the following parameters:

a. Integration/Hold and Dump Clock Signals. (3.2.4.3.6.1)
(Time and amplitude)

b. Integration Time (Analog Output). (3.2.4.3.6.2)
(Time and amplitude)

3.2.4.3.6.1 *Integration/hold and dump clock signals.* The integration/hold and dump clock signals shall be tested as follows:

1. Referring to Figure 23, configure the oscilloscope as follows:

   (a) Channel-1 to J7-23 integration/hold clock signal (J7-26 RTN).

   (b) Channel-2 to J7-6 dump signal clock (J7-26 RTN).

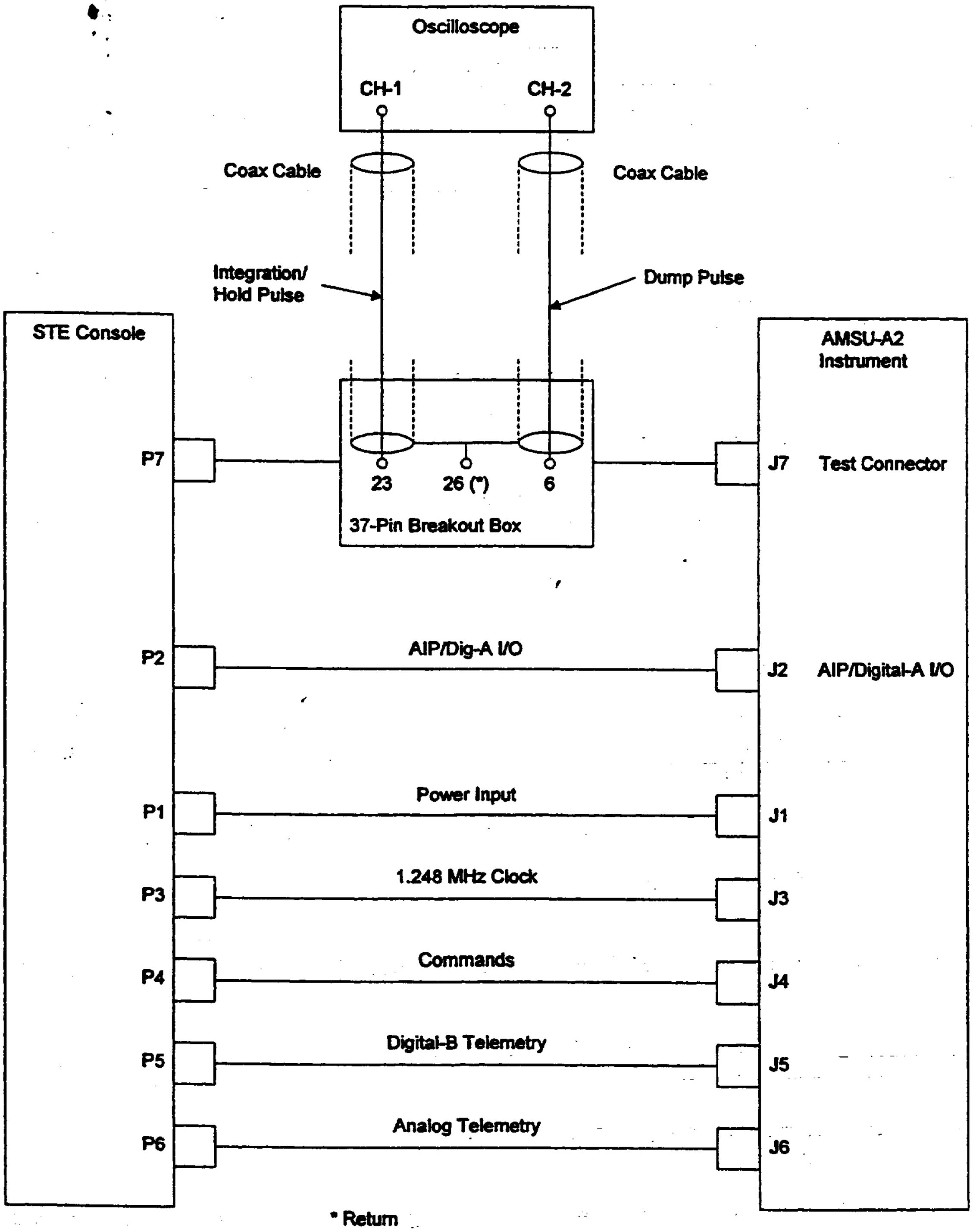


Figure 23. Integration/Hold and Dump Signals Verification Test Setup

(c) Internal trigger mode to channel-1.

(d) Amplitude and Time optimized for best resolution.

2. Power on unit by referring to 3.2.3.5.

3. Photograph or plot the oscilloscope display and attach the photograph or plot to TDS 34.

4. From the photograph or plot, measure time and amplitude for the integrate/hold and dump clock signals. Verify that the data obtained are within the requirements specified on TDS 34 and Figure 2.

5. Leave the equipment in place and the unit turned on in preparation for the next test.

3.2.4.3.6.2 ***Integration time (analog outputs).*** The analog outputs integration time shall be tested as follows:

1. Reconfigure the test equipment as indicated in Figure 24.

2. Connect the oscilloscope, channel-2 positive line to J7-8 of the 37-pin breakout box. Keep channel-1 of the oscilloscope connected to J7-23 and J7-26 (RTN).

3. Adjust the oscilloscope for best amplitude and time resolution. The displayed signals should look like Figure 2.

4. Photograph or plot the display and attach it to TDS 35.

5. From the photograph or plot, measure the integration time and the amplitude. Verify that the data obtained is within the requirements specified in TDS 35.

6. Connect the oscilloscope to the analog signal for channel-2 (J7-9) and repeat steps 2 through 5.

7. Leave the unit turned on and the test equipment in place in preparation for the next test.

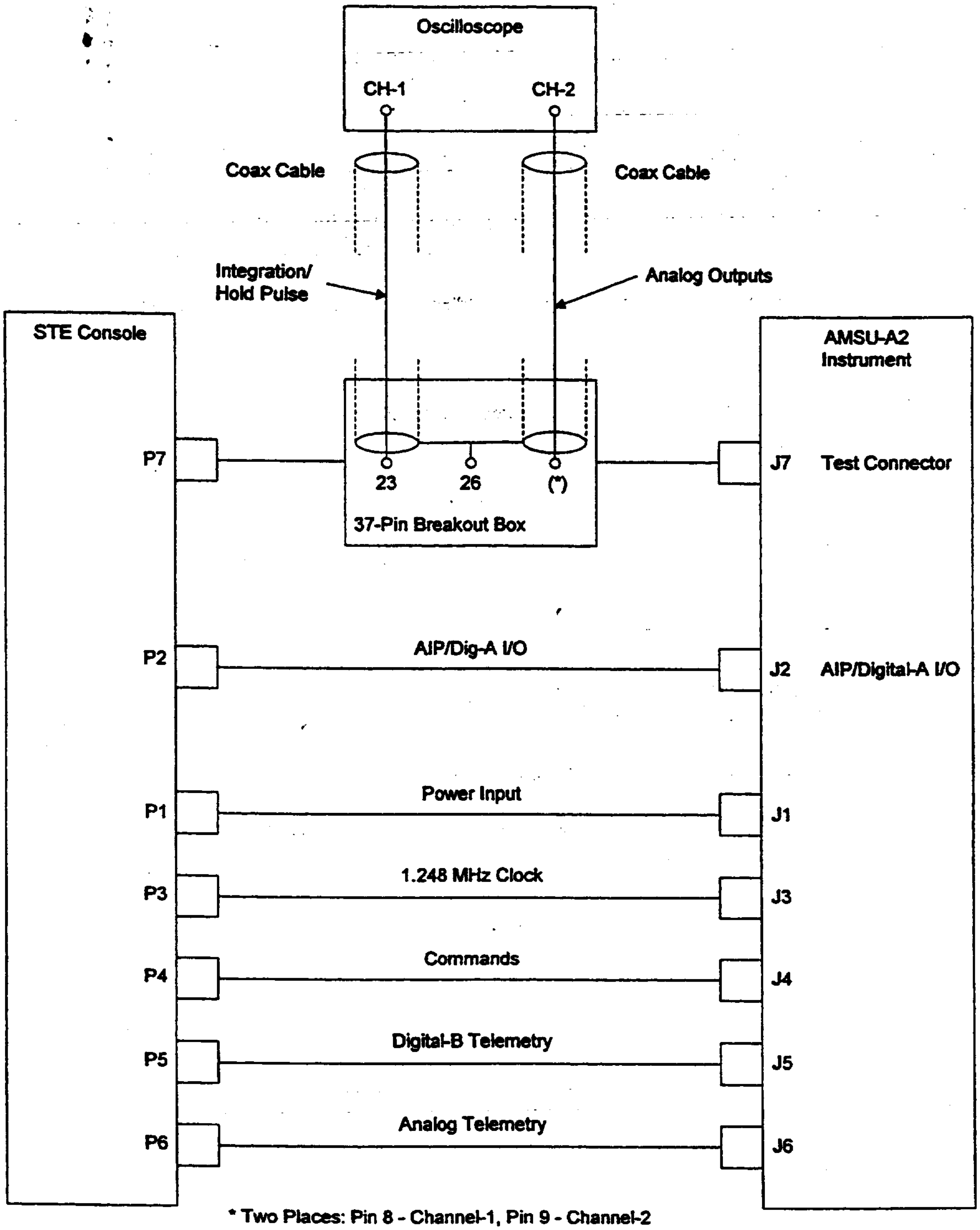


Figure 24. Integration Time (Analog Output) Verification Setup

3.2.4.3.7 ***GSE mode test***. The purpose of this test is to verify the data obtained from the Ground Support Equipment (GSE).

NOTE

The GSE mode test is not required and is for engineering use only.

The following modes shall be evaluated.

GSE-1 (Position: 10, 10, 10)

GSE-2 (Position: 1, 30 readings)

GSE-3 (Position: current, 30 readings)

GSE-4 (Position: 30, 30 readings)

GSE-5 (Position: 6, 30 readings)

GSE-7 (Position: required, 30 readings)

For GSE mode-1, the following parameters are subject to pass or fail criterion:

[I] Sync. sequence

[II] Unit ID and serial number

[III] Digital B serial data verification

[IV] Reflector positions

[V] Radiometric data (Scene data for channel-1 only)

[VI] Temperature sensors.

For GSE 2 through 7, only the following parameters are subject to pass or fail criterion:

[IV] Reflector position.

3.2.4.3.7.1 ***Equipment preparation.*** To place instrument in GSE mode, proceed as follows:

1. On Commands Menu, press: RETURN [1].
2. On Main Menu, select: [10] SELF TEST.
3. On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)
4. Enter corresponding GSE mode under test.

3.2.4.3.7.2 ***GSE Mode-1***. The GSE mode-1 shall be tested as follows:

[I], [II], and [III] Sync, Unit ID, and Digital B:

1. Place instrument in GSE mode-1 and obtain full printout. Using the printout, verify that elements 1 through 8 are within the values specified on TDS 36. Record pass or fail.

[IV] Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 37. Attach printout to TDS 37.

[V] Radiometric Data:

3. Using STE procedure AE-26157, select radiometric data screen for channel-1 and channel-2. Obtain a single page printout for each channel. Verify that the radiometric data is within the required values specified on TDS 38. Attach printout to TDS 38.

[VI] Temperature Sensors:

4. Using STE procedure AE-26157, select DIG-A temp. sensor data screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of the page. Verify that the temperature data are within the required values specified on TDS 39. Record pass or fail on TDS 39. Attach printout to TDS 39.

3.2.4.3.7.3 ***GSE Mode-2***. The GSE Mode-2 shall be tested as follows:

1. Place unit in GSE Mode-2 as follows:

   (a) On Commands Menu, press: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)

   (d) Enter GSE MODE [2] at the prompt.

[IV] Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that the reflector positions are within the required values specified on document AE-26002/2. Record pass or fail on TDS 37. Attach printout to TDS 37.

3.2.4.3.7.4 ***GSE Mode-3***. The GSE Mode-3 shall be tested as follows:

1. Place unit in GSE Mode-3 as follows:

   (a) On Commands Menu, press: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)

   (d) Enter GSE MODE [3] at the prompt.

Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 37. Attach printout to TDS 37.

3.2.4.3.7.5 *GSE Mode-4*. The GSE Mode-4 shall be tested as follows:

1. Place unit in GSE Mode-4 as follows:

   (a) On Commands Menu, press: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)

   (d) Enter GSE MODE [4] at the prompt.

[IV] Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 37. Attach printout to TDS 37,

3.2.4.3.7.6 *GSE Mode-5*. The GSE Mode-5 shall be tested as follows:

1. Place unit in GSE Mode-5 as follows:

   (a) On Commands Menu, press: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)

   (d) Enter GSE MODE [5] at the prompt.

[IV] Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 37. Attach printout to TDS 37.

3.2.4.3.7.7 *GSE Mode-7*. The GSE Mode-7 shall be tested as follows:

1. Place unit in GSE Mode-7 as follows:

   (a) On Commands Menu, press: RETURN [1].

   (b) On Main Menu, select: [10] SELF TEST.

   (c) On Self Test Menu, select: [7] RUN GSE MODE.
   (The computer will prompt: "ENTER GSE MODE (0 to 15)".)

(d) Enter GSE MODE [7] at the prompt.

(e) Press PRINT [3] FULL. The computer will start printing 4 pages of data.

[IV] Reflector Positions:

2. Using STE procedure AE-26157, select reflector position screen and execute "PRINT [2] SCREEN ONLY" to obtain a printout of data. Verify that there is no "E" error on computer printout. Record pass or fail on TDS 37. Attach printout to TDS 37.

3. Set the STE to GSE MODE-0. Failure to do so will cause the STE to produce faulty data when in normal mode. To enter GSE Mode-0 into the computer, proceed as follows:

(a) Return to the Main Menu by pressing: RETURN [1].

(b) On Main Menu, select: [10] SELF TEST.

(c) On Self Test Menu, select: [7] RUN GSE MODE.
(The computer will prompt: "ENTER GSE MODE (0 to 15)".)

(d) Select GSE MODE [0].

3.2.4.4 ***Radiometer functional test.*** The purpose of this procedure is to verify the performance of the AMSU-A2 radiometer at the system level. This test shall consist of relative NEΔT measurements.

3.2.4.4.1 ***Relative radiometer NEΔT measurements.*** The purpose of this test is to perform a preliminary evaluation of the radiometer NEΔT at a system level. Since the STE is not in the thermal-vacuum configuration, no temperature readings from the cold load are available. To compute the NEΔT for this test, the temperature used for the cold load shall be 80 K.

The data obtained from this test are considered as "relative NEΔT" and are to be used as a diagnostic tool to verify proper operation of the A/D converters and the spacecraft interface.

The equation to determine "relative NEΔT" is as follows:

$$GAIN = \frac{Th - Tc}{M - N}$$

$$NE\Delta T = SD \times GAIN$$

where

SD = Standard deviation of 120 samples at hot temperature
Th = Standard room temperature = deg. K
Tc = Standard LN_2 temperature = 80 K
M = Average of hot counts (120 samples)
N = Average of cold counts (30 samples)

The sequence of testing shall be as follow:

a. Equipment preparation and setup configuration (3.2.4.4.1.1)

b. Relative NEΔT data collection (3.2.4.4.1.2)

3.2.4.4.1.1 ***Equipment preparation and setup configuration.*** The equipment shall be setup as follows:

WARNING

The use of liquid nitrogen in a confined poorly ventilated area can cause rapid asphyxiation and death due to a lack of oxygen (oxygen concentration below 20 percent). Accidental contact with liquid nitrogen will cause severe frostbite to the eyes or skin. When handling liquid nitrogen, personnel shall observe the following safety precautions:

a. Ensure that the work area is well ventilated to prevent excessive gas buildup.

b. To protect your eyes, always wear a face shield or safety goggles (safety glasses without side shields do not provide adequate protection).

c. To protect exposed skin, always wear a lab coat, gloves made for cryogenic work, cuffless trousers (worn outside the boots or shoes), and safety shoes.

1. Configure the test equipment and the unit as indicated in Figure 25. Connect the instrument to STE as shown in Figure 26 without breakout boxes.

2. Execute commands as necessary to obtain the following configuration:

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POS =	NO	[15]
[10]	SURVIAL HTR PWR =	OFF	ANTENNA IN NADIR POS=	NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA FULL SCAN MODE =	NO	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14]	ANTENNA WARM CAL POS =	YES			
POWER [4] ON					

3. Allow 30 minutes for the unit to stabilize.

3.2.4.4.1.2 ***Relative NEΔT data collection.*** Perform the following procedures.

1. Return to the Main Menu by pressing [1] RETURN.

2. On the Main Menu, select [13] FUNCTIONAL TEST. (The STE will automatically command the unit to position the antenna reflector to the warm and cold loads as it is taking data.)

3. Wait approximately one minute to verify that the NEΔT results are displayed on the screen. Obtain a printout. Repeat step 2 four times and obtain four additional printouts. Average NEΔT from these five data points. Enter the values on TDS 40. Attach the printouts to TDS 40 (Appendix B, TDS B-12 for LPT).

4. Remove the cryogenic loads and associated hardware.

5. Turn off the unit by using command "[11] MODULE TOTALLY OFF". Turn off +28 V power supply at the STE console.

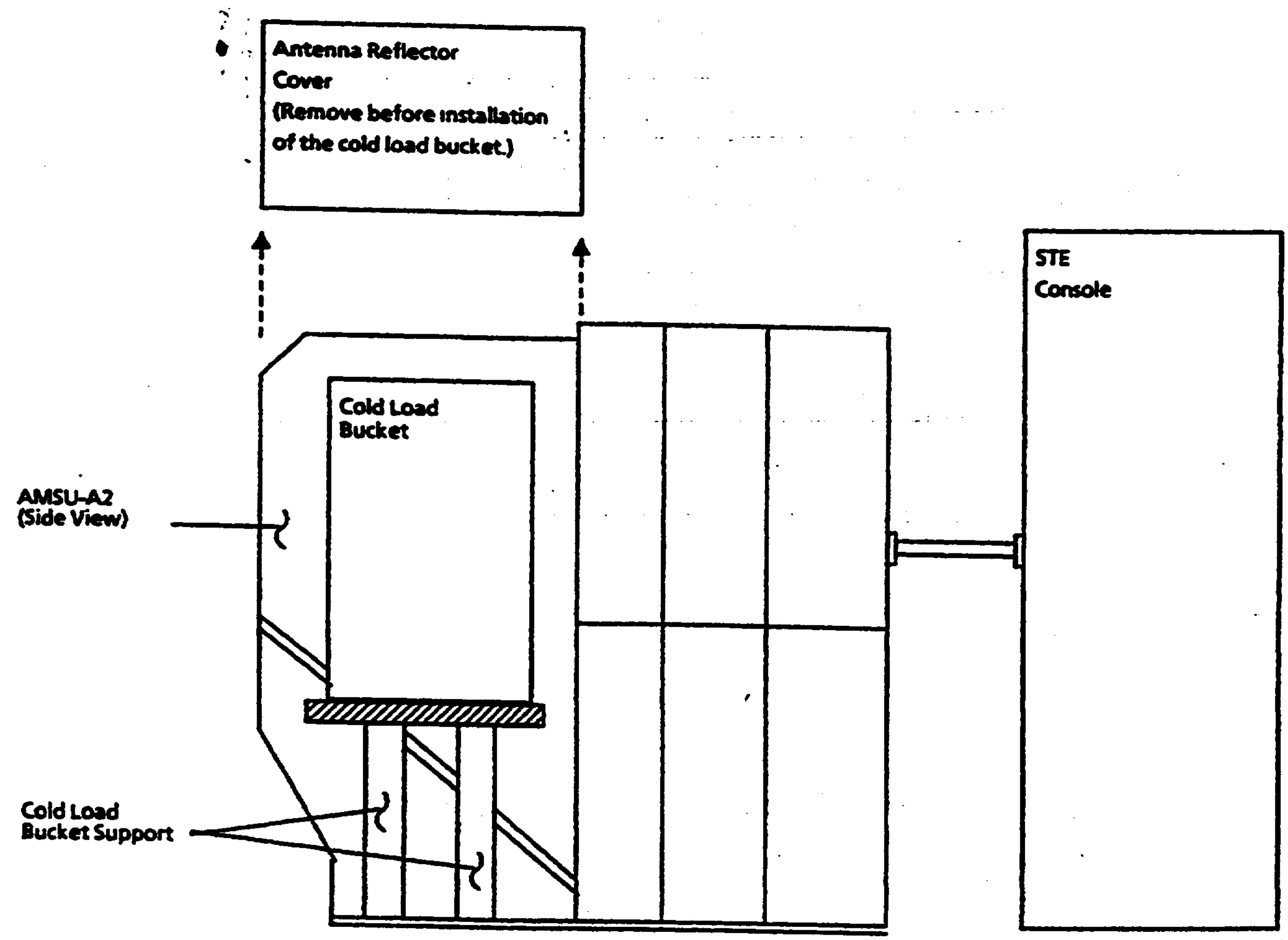


Figure 25. NEΔT Setup Configuration

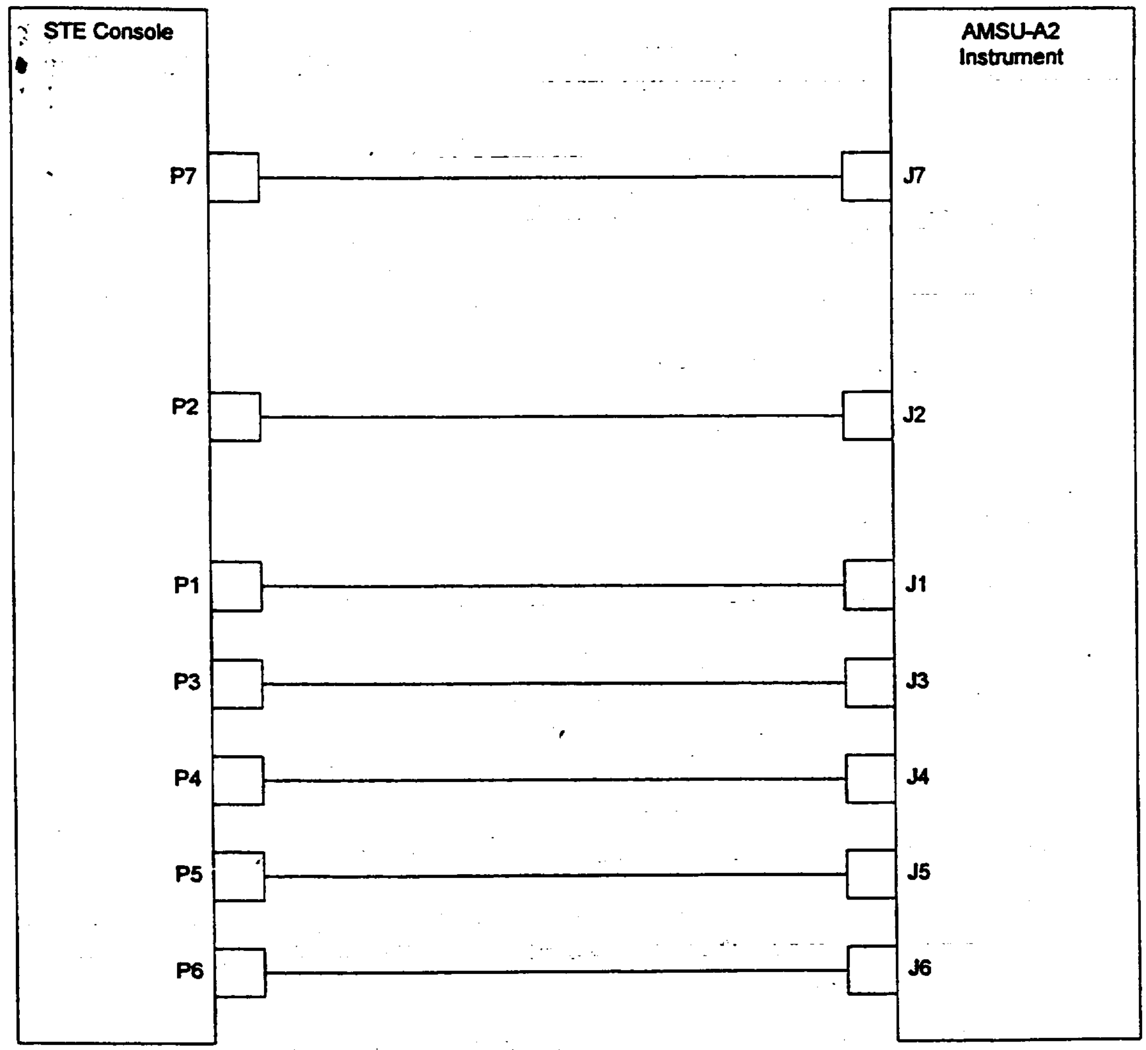


Figure 26. Relative NEΔT Measurement Test Setup

3.2.4.4.2 ***Channel identification test.*** The purpose of the channel identification test is to verify the proper final configuration/assembly of each radiometer channel from antenna input to the spacecraft interface.

1. Configure the unit and test equipment as shown in Figure 27.

2. Turn the STE main power switch ON. From the A2 directory, and at the "$" prompt, enter the command to the STE "RUN A2".

3. Turn the STE power supply panel main power switch ON.

4. Turn the STE power supply panel Q/Main switch ON.

5. Turn the power supply N/Pulse switch ON.

6. From the STE main screen, enter the STE command "[2] MONITOR ONLY". Enter the STE command "[14] COMMANDS".

7. Enter the STE command "SCANNER POWER". Wait 18 seconds before issuing the next command.

8. Enter the STE command "ANTENNA COLD CAL". Wait 18 seconds before issuing the next command. The reflector should scan to the cold calibration beam position.

9. Enter the STE command "[1] RETURN" to return to the monitor only screen.

10. Enter the STE command "[10] SCIENCE DATA". The STE should now display the science data screen. From this screen enter the STE command "[9] BEAM POSITION NN-ALL CHANNELS".

11. The STE prompts "ENTER BEAM POSITION NO (1 TO 30)". Enter "30" to show the radiometric counts data for channels 1 and 2. The STE now displays the radiometric data screen shown in Figure 28 except with a different set of count data.

12. Allow the instrument to stabilize for approximately 20 minutes. Enter the STE command "[2]" to obtain a screen only printout.

13. Configure the unit and test equipment as shown in Figure 27. Turn ON the sweeper and allow to warm up approximately 10 minutes. Make sure that the RF power is OFF during sweeper warm up.

CAUTION

> Extreme care must be used when turning on RF power. When RF power is first applied the gain horn should be approximately three to four feet from the unit. The RF power setting should be no greater than -20 dBm.

14. Set the sweeper frequency to 23.80 ± 0.01 GHz and set the RF power level to -20 dBm. Position the gain horn three to four feet from the instrument so that the antenna and gain horn are approximately aligned. Rotate the gain horn, if needed, to the vertical polarization position.

15. Turn ON the RF power making sure the power level is set to -20 dBm. Allow the multiplier to warm up approximately five minutes.

16. At the STE screen, compare the radiometric data counts of channel 1 to the counts printed out at step 12. Enter the STE command "[2]" to obtain a screen only printout.

17. From the printouts obtained in steps 12 and 16 verify that the radiometric data counts for channel 1 have increased significantly, approximately 1000 or more, and that the other channels data counts have remained relatively unchanged, less than 300 counts.

18. Record the count differences on TDS 40A of channel 1 from the printouts obtained in steps 12 and 16 and attach printouts to TDS 40A.

19. Turn OFF the RF power. Return the reflector to the warm cal position.

20. Turn the STE Q/Main and N/Pulse switches to OFF.

21. Turn the STE power supply panel main power switch OFF.

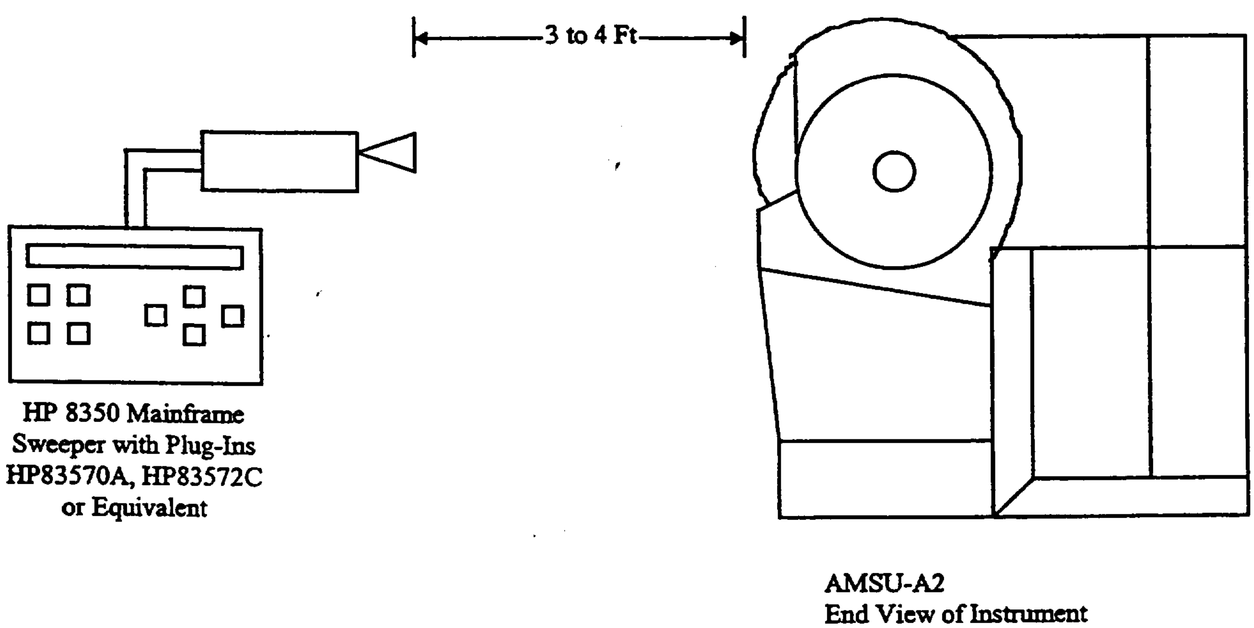


Figure 27. Channel Identification Setup

EOS ' A2.XX E2.EXE;4 4-MAR-98 14:53:41 SCAN NUMBER

[5] SCIENCE DATA ELEMENT 0000

[6] CONTROL/STATUS ELEMENT 00

[7] ENGINEERING ELEMENT 00

RADIOMETRIC DATA

BEAM POSITION 1

CH	DATA
1	16,275
2	16,189

[21] UP [22] DOWN

POWER OFF CHECKSUM IN CALC SA28 0 SA29 0

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT BUTTON 2

Figure 28. Radiometric Data Screen

4. QUALITY ASSURANCE PROVISIONS

4.1 ***Responsibility for inspection.*** Aerojet Quality Assurance shall inspect in accordance with the requirements of this test procedure and S-480-79 and S-480-80. Quality Control shall verify all test set-ups prior to start of test. Bonded software shall be used for all tests and shall be obtained from Quality Control. Quality Control shall review all test data for conformance to success criteria. The test data shall include test limits. For tests that satisfy requirements from S-480-80 on protoflight and flight units, customer representatives shall be invited to witness tests and shall be invited to review the data and show approval on the test data sheets.

4.1.1 ***Test facilities.*** Unless otherwise specified, the examinations and tests described herein shall be conducted at GenCorp Aerojet, Azusa, CA.

4.1.2 ***Electrostatic Device (ESD) handling.*** All electronic hardware shall be handled in accordance with Aerojet Standard STD-2454.

4.2 ***Monitoring procedures.*** All tests in this procedure shall be witnessed by quality control.

4.2.1 ***Test equipment.*** Test equipment calibration procedures shall comply with the requirements of MIL-STD-45662.

4.2.2 ***Software.*** Bonded software shall be used at all times.

4.3 ***Monitoring procedures for materials.*** Not applicable.

4.4 ***Certification.*** Certification for handling ESD-sensitive equipment is required for all personnel working on the assembly and test of the AMSU-A instrument.

4.5 ***Test methods***

4.5.1 ***Accept-reject criteria.*** The accept-reject criteria for each examination or test shall be as specified in the data sheets included in each phase of the applicable test procedure. The test results shall be recorded on the data sheets to demonstrate compliance with the applicable specification requirements. Methods of analysis shall be appropriate for the parameters being inspected. It shall be the responsibility of Aerojet to review the test data and determine conformance of the unit under test to the performance requirements contained in S-480-80 and this specification.

In the event of a failure during any phase of this test procedure, the test activity shall record the required information on the Test Anomaly Record (TAR) and alert the design assurance and quality engineers. Except for failures which only represent a limited out-of-tolerance condition for a particular parameter and are not expected to interfere with the balance of the testing and which are non-destructive, the testing must be stopped until a complete description of the observed anomaly failure is documented and a Failure Analysis Strategy (FAS) is formulated, documented, and implemented to preclude loss of information or evidence that may facilitate determining the failure cause. The full set of data from the referenced tests is required in order to formulate a plan of action. The cognizant reliability engineer, quality assurance engineer, and the system or responsible test engineer shall jointly develop the FAS which must be approved by Design Assurance and Quality Assurance. Analysis and reporting shall be performed per Aerojet procedures.

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5. PREPARATION FOR DELIVERY

This section is not applicable to this specification.

6. NOTES

6.1 *Acronyms and abbreviations*

AMSU	Advanced Microwave Sounding Unit
ATB	Analog telemetry bus
AWG	American Wire Gage
BP	Beam Position
CAL	Calibrate
CPT	Comprehensive performance test
d	delta
DC	Direct current
DVM	Digital volt meter
EMI	Electromagnetic interference
ESD	Electrostatic Sensitive Device
EXT	External
FAS	Failure analysis strategy
GHz	Gigahertz
GIIS	General Instrument Interface Specification
GND	Ground
GSE	Ground Support Equipment
HTR	Heater
kHz	Kilohertz
LPT	Limited performance test
LSB	Least significant bit
MA	Milliamp
METSAT	Meteorological Satellite
MLB	Main load bus
MFG	Manufacturer
MMW	Millimeter wave
MS, MSEC	Millisecond
MSB	Most significant bit
MV	Millivolt
NEΔT	Noise equivalent delta temperature
PFM	Protoflight Model
PLB	Pulse load bus
PLL	Phase lock loop

PLLO	Phase lock loop oscillator
POS	Position
PWR	Power
RTN	Return
STE	Special Test Equipment
SW	
TAR	Test Anomaly Record
TDS	Test Data Sheet
TLM	Telemetry
TM	Instrument Temperature
UIIS	Unique Instrument Interface Specification
Vdc	Volts, direct current
μs	Microsecond

6.2 ***Changes***. The outside margins of this document have been marked to indicate where modifications, deletions, or additions have been made since the previous issue. This is done solely as a convenience to users, who are cautioned to evaluate the requirements of this change and the parent standard based on the entire content as written, regardless of the marginal notations and relationship to the previous issue.

APPENDIX A

TEST DATA SHEETS

10. APPENDIX A

10.1 *Scope.* This appendix contains the test data sheets for all tests and inspections listed in section 3.

TEST DATA SHEET 1 (SHEET 1 OF 9)
Grounding Test (Paragraph 3.2.4.1)

J1 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	+28V MLB	> 100k		
J1-2	+28V MLB	> 100k		
J1-3	+28V MLB RTN	> 100k		
J1-4	+28V MLB RTN	> 100k		
J1-5	+28V PLB	> 100k		
J1-6	+28V PLB	> 100k		
J1-7	+28V PLB RTN	> 100k		
J1-8	+28V PLB RTN	> 100k		
J1-9	+28V TMB	> 100k		
J1-10	28V TMB RTN	> 100k		
J1-11	NO CONNECTION	> 100k		
J1-12	NO CONNECTION	> 100k		
J1-13	CHASSIS GROUND (E1)	< 1		
J1-14	+28V MLB	> 100k		
J1-15	+28V MLB	> 100k		
J1-16	+28V MLB RTN	> 100k		
J1-17	+28V MLB RTN	> 100k		
J1-18	+28V PLB	> 100k		
J1-19	+28V PLB	> 100k		
J1-20	+28V PLB RTN	> 100k		
J1-21	+28V PLB RTN	> 100k		
J1-22	+28V TMB	> 100k		
J1-23	28V TMB RTN	> 100k		
J1-24	SAFETY HTR PWR	> 100k		
J1-25	SAFETY HTR RTN	> 100k		

TEST DATA SHEET 1 (Sheet 2 of 9)
Grounding Test (Paragraph 3.2.4.1)

J2 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-1	Chassis Ground (E2)	< 1		
J2-2	DATA CLOCK (C1)	> 100k		
J2-3	Signal Return	> 100k		
J2-4	No Connection	> 100k		
J2-5	DIGITAL A DATA OUT	> 100k		
J2-6	DATA ENABLE (A1)	> 100k		
J2-7	8 SEC SYNC PULSE	> 100k		
J2-8	No Connection	> 100k		
J2-9	No Connection	> 100k		

J3 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J3-1	1.248 MHz CLK	> 100k		
J3-2	1.248 MHz CLK RTN	> 100k		
J3-3	Chassis GND (E3)	< 1		

J5 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J5-1	Chassis Ground (E5)	< 1		
J5-2	MODULE PWR IND	> 100k		
J5-3	COLD CAL POS MSB (OUT)	> 100k		
J5-4	No Connection	> 100k		
J5-5	COMP MTR IND	> 100k		
J5-6	ANT IN COLD CAL POS	> 100k		
J5-7	No Connection	> 100k		
J5-8	No Connection	> 100k		
J5-9	SURV HTR ON/OFF	> 100k		
J5-10	No Connection	> 100k		
J5-11	COLD CAL POS LSB (OUT)	> 100k		
J5-12	SCANNER ON PWR IND	> 100k		
J5-13	ANT IN WARM CAL POS	> 100k		
J5-14	ANT AT NADIR POS	> 100k		
J5-15	FULL SCAN MODE	> 100k		

TEST DATA SHEET 1 (Sheet 3 of 9)
Grounding Test (Paragraph 3.2.4.1)

J4 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J4-1	Chassis Ground (E4)	< 1		
J4-2	MODULE PWR DISCONN	> 100k		
J4-3	SURVIVAL HTR ON	> 100k		
J4-4	MODULE TOTALLY OFF	> 100k		
J4-5	COMP MTR ON/OFF	> 100k		
J4-6	ANT AT COLD CAL POS	> 100k		
J4-7	No Connection	> 100k		
J4-8	ANT AT NADIR POS	> 100k		
J4-9	COLD CAL POS MSB (IN)	> 100k		
J4-10	No Connection	> 100k		
J4-11	No Connection	> 100k		
J4-12	+10V INTERFACE BUS	> 100k		
J4-13	10V INTERFACE BUS RTN	> 100k		
J4-14	MODULE PWR CONN	> 100k		
J4-15	SURVIVAL HTR OFF	> 100k		
J4-16	SCANNER PWR ON/OFF	> 100k		
J4-17	ANT AT WARM CAL POS	> 100k		
J4-18	FULL SCAN	> 100k		
J4-19	COLD CAL POS LSB (IN)	> 100k		
J4-20	No Connection	> 100k		
J4-21	No Connection	> 100k		
J4-22	No Connection	> 100k		
J4-23	No Connection	> 100k		
J4-24	+10V INTERFACE BUS	> 100k		
J4-25	10V INTERFACE BUS RTN	> 100k		

TEST DATA SHEET 1 (Sheet 4 of 9)
Grounding Test (Paragraph 3.2.4.1)

J6 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-1	Chassis GND (E6)	< 1		
J6-2	RF SHELF TEMP	> 100k		
J6-3	COMP. MTR. TEMP	> 100k		
J6-4	WARM LOAD TEMP	> 100k		
J6-5	No Connection	> 100k		
J6-6	No Connection	> 100k		
J6-7	No Connection	> 100k		
J6-8	SCAN MTR CURR	> 100k		
J6-9	+15V ANT DR MON	> 100k		
J6-10	+15V ANT DR MON	> 100k		
J6-11	+15V SIG PROC MON	> 100k		
J6-12	+15V SIG PROC MON	> 100k		
J6-13	L.O. #1 MON	> 100k		
J6-14	No Connection	> 100k		
J6-15	No Connection	> 100k		
J6-16	No Connection	> 100k		
J6-17	No Connection	> 100k		
J6-18	No Connection	> 100k		
J6-19	No Connection	> 100k		
J6-20	28V TMB RTN	> 100k		
J6-21	No Connection	> 100k		
J6-22	SCAN MTR TEMP	> 100k		
J6-23	No Connection	> 100k		
J6-24	No Connection	> 100k		
J6-25	No Connection	> 100k		
J6-26	No Connection	> 100k		
J6-27	COMP MTR CURR	> 100k		
J6-28	-15V ANT DR MON	> 100k		
J6-29	-15V SIG PROC MON	> 100k		
J6-30	L.O. #2 MON	> 100k		
J6-31	No Connection	> 100k		
J6-32	No Connection	> 100k		
J6-33	No Connection	> 100k		
J6-34	MIXER/AMP MON	> 100k		
J6-35	No Connection	> 100k		
J6-36	No Connection	> 100k		
J6-37	No Connection	> 100k		

TEST DATA SHEET 1 (Sheet 5 of 9)
Grounding Test (Paragraph 3.2.4.1)

J7 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J7-1	Chassis GND (E7)	< 1		
J7-2	No Connection	> 100k		
J7-3	No Connection	> 100k		
J7-4	No Connection	> 100k		
J7-5	15V RTN (2/3)	> 100k		
J7-6	DUMP TP	> 100k		
J7-7	No Connection	> 100k		
J7-8	CH1 ANALOG OUT TP	> 100k		
J7-9	CH2 ANALOG OUT TP	> 100k		
J7-10	No Connection	> 100k		
J7-11	No Connection	> 100k		
J7-12	No Connection	> 100k		
J7-13	No Connection	> 100k		
J7-14	No Connection	> 100k		
J7-15	No Connection	> 100k		
J7-16	No Connection	> 100k		
J7-17	GSE CMD LSB	> 100k		
J7-18	GSE CMD MSB-1	> 100k		
J7-19	+5VDC GSE INTERLOCK A	> 100k		
J7-20	No Connection	> 100k		
J7-21	No Connection	> 100k		
J7-22	No Connection	> 100k		
J7-23	I/H TP	> 100k		
J7-24	No Connection	> 100k		
J7-25	No Connection	> 100k		
J7-26	15V RTN (2/3)	> 100k		
J7-27	No Connection	> 100k		
J7-28	No Connection	> 100k		
J7-29	No Connection	> 100k		
J7-30	No Connection	> 100k		
J7-31	No Connection	> 100k		
J7-32	No Connection	> 100k		
J7-33	No Connection	> 100k		
J7-34	No Connection	> 100k		
J7-35	GSE CMD MSB	> 100k		
J7-36	5V RTN (1)	> 100k		
J7-37	+5VDC GSE INTERLOCK B	> 100k		

TEST DATA SHEET 1 (Sheet 6 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	J1-2	+28V MLB	< 1		
J1-1	J1-14	+28V MLB	< 1		
J1-1	J1-15	+28V MLB	< 1		
J1-3	J1-4	28V MLB RTN	< 1		
J1-3	J1-16	28V MLB RTN	< 1		
J1-3	J1-17	28V MLB RTN	< 1		
J1-5	J1-6	+28V PLB	< 1		
J1-5	J1-18	+28V PLB	< 1		
J1-5	J1-19	+28V PLB	< 1		
J1-7	J1-8	28V PLB RTN	< 1		
J1-7	J1-20	28V PLB RTN	< 1		
J1-7	J1-21	28V PLB RTN	< 1		
J1-9	J1-22	+28V TMB	< 1		
J1-10	J1-23	28V TMB RTN	< 1		
J1-10	J6-20	28V TMB RTN	< 1		
J4-12	J4-24	+10V INTERFACE BUS	< 1		
J4-13	J4-25	10V INTERFACE BUS RTN	< 1		
J1-1	J1-3	+28V MLB	> 100k		
J1-1	J1-5	+28V MLB	> 100k		
J1-1	J1-7	+28V MLB	> 100k		
J1-1	J1-9	+28V MLB	> 100k		
J1-1	J1-10	+28V MLB	> 100k		
J1-1	J1-24	+28V MLB	> 100k		
J1-1	J1-25	+28V MLB	> 100k		
J1-1	J2-3	+28V MLB	> 100k		
J1-1	J4-12	+28V MLB	> 100k		
J1-1	J4-13	+28V MLB	> 100k		
J1-3	J1-5	28V MLB RTN	> 100k		
J1-3	J1-7	28V MLB RTN	> 100k		
J1-3	J1-9	28V MLB RTN	> 100k		
J1-3	J1-10	28V MLB RTN	> 100k		
J1-3	J1-24	28V MLB RTN	> 100k		
J1-3	J1-25	28V MLB RTN	> 100k		
J1-3	J2-3	28V MLB RTN	> 100k		
J1-3	J4-12	28V MLB RTN	> 100k		
J1-3	J4-13	28V MLB RTN	> 100k		

TEST DATA SHEET 1 (Sheet 7 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-5	J1-7	+28V PLB	> 100k		
J1-5	J1-9	+28V PLB	> 100k		
J1-5	J1-10	+28V PLB	> 100k		
J1-5	J1-24	+28V PLB	> 100k		
J1-5	J1-25	+28V PLB	> 100k		
J1-5	J2-3	+28V PLB	> 100k		
J1-5	J4-12	+28V PLB	> 100k		
J1-5	J4-13	+28V PLB	> 100k		
J1-7	J1-9	28V PLB RTN	> 100k		
J1-7	J1-10	28V PLB RTN	> 100k		
J1-7	J1-24	28V PLB RTN	> 100k		
J1-7	J1-25	28V PLB RTN	> 100k		
J1-7	J2-3	28V PLB RTN	> 100k		
J1-7	J4-12	28V PLB RTN	> 100k		
J1-7	J4-13	28V PLB RTN	> 100k		
J1-9	J1-10	+28V TMB	> 100k		
J1-9	J1-24	+28V TMB	> 100k		
J1-9	J1-25	+28V TMB	> 100k		
J1-9	J2-3	+28V TMB	> 100k		
J1-9	J4-12	+28V TMB	> 100k		
J1-9	J4-13	+28V TMB	> 100k		
J1-10	J1-24	28V TMB RTN	> 100k		
J1-10	J1-25	28V TMB RTN	> 100k		
J1-10	J2-3	28V TMB RTN	> 100k		
J1-10	J4-12	28V TMB RTN	> 100k		
J1-10	J4-13	28V TMB RTN	> 100k		
J1-24	J1-25	SAFETY HTR PWR	> 100k		
J1-24	J2-3	SAFETY HTR PWR	> 100k		
J1-24	J4-12	SAFETY HTR PWR	> 100k		
J1-24	J4-13	SAFETY HTR PWR	> 100k		
J1-25	J2-3	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-12	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-13	SAFETY HTR PWR RTN	> 100k		
J2-3	J4-12	SIGNAL RTN	> 100k		
J2-3	J4-13	SIGNAL RTN	> 100k		
J4-12	J4-13	+10V INTERFACE BUS	> 100k		

TEST DATA SHEET 1 (Sheet 8 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-2	J4-13	DATA CLOCK (C1)	> 2k		
J2-5	J4-13	DIGITAL A DATA OUT	> 2k		
J2-6	J4-13	DATA ENABLE (A1)	> 2k		
J2-7	J4-13	8 SEC SYNC PULSE	> 2k		
J3-1	J4-13	1.248 MHZ CLK	> 2k		
J3-2	J4-13	1.248 MHZ CLK RTN	> 2k		
J4-2	J4-13	MODULE PWR DISCONN	> 2k		
J4-3	J4-13	SURVIVAL HTR ON	> 2k		
J4-4	J4-13	MODULE TOTALLY OFF	> 2k		
J4-5	J4-13	COMP MTR ON/OFF	> 2k		
J4-6	J4-13	ANT AT COLD CAL POS	> 2k		
J4-8	J4-13	ANT AT NADIR POS	> 2k		
J4-9	J4-13	COLD CAL POS MSB (IN)	> 2k		
J4-14	J4-13	MODULE PWR CONN	> 2k		
J4-15	J4-13	SURVIVAL HTR OFF	> 2k		
J4-16	J4-13	SCANNER PWR ON/OFF	> 2k		
J4-17	J4-13	ANT AT WARM CAL POS	> 2k		
J4-18	J4-13	FULL SCAN	> 2k		
J4-19	J4-13	COLD CAL POS LSB (IN)	> 2k		
J5-2	J4-13	MODULE PWR IND	> 2k		
J5-3	J4-13	COLD CAL POS MSB	> 2k		
J5-5	J4-13	COMP MTR IND	> 2k		
J5-6	J4-13	ANT IN COLD CAL POS	> 2k		
J5-9	J4-13	SURV HTR ON/OFF	> 2k		
J5-11	J4-13	COLD CAL POS LSB	> 2k		
J5-12	J4-13	SCANNER ON PWR IND	> 2k		
J5-13	J4-13	ANT IN WARM CAL POS	> 2k		
J5-14	J4-13	ANT IN NADIR POS	> 2k		
J5-15	J4-13	FULL SCAN MODE	> 2k		

TEST DATA SHEET 1 (Sheet 9 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-8	J4-13	SCAN MTR CURR	> 2k		
J6-9	J4-13	+15V ANT DR MON	> 2k		
J6-10	J4-13	+5V ANT DR MON	> 2k		
J6-11	J4-13	+15V SIG PROC MON	> 2k		
J6-12	J4-13	+5V SIG PROC MON	> 2k		
J6-13	J4-13	L.O. #1 MON	> 2k		
J6-20	J4-13	28V TMB RTN	> 2k		
J6-22	J4-13	SCAN MTR TEMP	> 2k		
J6-27	J4-13	COMP MTR CURR	> 2k		
J6-28	J4-13	-15V ANT DR MON	> 2k		
J6-29	J4-13	-15V SIG PROC MON	> 2k		
J6-30	J4-13	L.O. #2 MON	> 2k		
J6-34	J4-13	MIXER/AMP MON	> 2k		
J6-2	J1-10	RF SHELF TEMP	> 2k		
J6-3	J1-10	COMP MTR.TEMP	> 2k		
J6-4	J1-10	WARM LOAD TEMP	> 2k		

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________ LPT __________

Test Systems Engineer Date

Customer Representative Date Quality Control Date

TEST DATA SHEET 2
+28 MLB Turn-on Transient (Paragraph 3.2.4.2.1.1)

At 28.56 Vdc:

Step	Parameter	Measured/ Calculated	Required		Pass/ Fail
			*	**	
7	Peak Current	______Amps	<8.3 Amps	<5.7 Amps	
7	Pulse Width	______ms	<100 ms	<120 ms	
7	Rate of Change (Slope): dI/dT	_____mA/µs	<640 mA/µs	<250 mA/µs	

At 27.44 Vdc:

Step	Parameter	Measured/ Calculated	Required		Pass/ Fail
			*	**	
7	Peak Current	______Amps	<8.3 Amps	<5.7 Amps	
7	Pulse Width	______ms	<100 ms	<120 ms	
7	Rate of Change (Slope): dI/dT	_____mA/µs	<640 mA/µs	<250 mA/µs	

At 28.00 Vdc:

Step	Parameter	Measured/ Calculated	Required		Pass/ Fail
			*	**	
7	Peak Current	______Amps	<8.3 Amps	<5.7 Amps	
7	Pulse Width	______ms	<100 ms	<120 ms	
7	Rate of Change (Slope): dI/dT	_____mA/µs	<640 mA/µs	<250 mA/µs	

* For S/N 101 through 104
** For S/N 105 through 109.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 3
+28 MLB Operating Power (Paragraph 3.2.4.2.1.2)

Step	+28V MLB at 27 Volts	Measured	Units	Required	Pass/Fail
4	+28V MLB voltage at 27V (V_b) (Measured)		Volts	27.0 ± 0.1	
5	Average Current (I_V)		Amps	N/A	N/A
6	+28V MLB bus power = I_V x V_b		Watts	25W max	
	+28V MLB at 28 Volts				
7	+28V MLB Bus Voltage at 28V (V_b) (Measured)		Volts	28.0 ± 0.1	
8	Average Current (I_V)		Amps	N/A	N/A
9	+28V MLB Operating Power = I_V X V_b		Watts	25W max	
	+28V MLB at 29 Volts				
10	+28V MLB voltage at 29V (V_b) (Measured)		Volts	29.0 ± 0.1	
11	Average Current (I_V)		Amps	N/A	N/A
12	+28V MLB operating power = I_V x V_b		Watts	25W max	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Quality Control Date
(Flight Hardware Only)

TEST DATA SHEET 4
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.7)

Peak current

Paragraph	Parameter	Measured or Calculated	Required	Pass/ Fail
3.2.4.2.2.1	From -0.1 to two seconds			
	Peak Current = I_p	__Amps	2.2 amps max	
3.2.4.2.2.2	From 2 to 4 seconds			
	Peak Current = I_p	__Amps	2.2 amps max	
3.2.4.2.2.3	From 4 to 6 seconds			
	Peak Current = I_p	__Amps	2.2 amps max	
3.2.4.2.2.4	From 6 to 8 seconds			
	Peak Current = I_p	__Amps	2.2 amps max	
3.2.4.2.2.5	Eight Sec. Integrated Current Measurement			
	Current	__mA	none	
3.2.4.2.2.7	Turn-on Transient:			
	Turn-on pulse width Peak Current = I_p dI/dT	___ms __Amps __mA/µs	 ≤9.6 Amps 846 mA/µs *	

* Refer to Figure 10.

Bus current during the I/H,D period

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.1	From -0.1 to 2 seconds	__mA	N/A
3.2.4.2.2.2	From 2 to 4 seconds	__mA	N/A
3.2.4.2.2.3	From 4 to 6 seconds	__mA	N/A
3.2.4.2.2.4	From 6 to 8 seconds	__mA	N/A

Bus current during warm cal, cold cal, and nadir

Paragraph	Parameter	Measured	Pass/ Fail
3.2.4.2.2.6 (2)	Warm cal	__mA	N/A
3.2.4.2.2.6 (3)	Cold cal	__mA	N/A
3.2.4.2.2.6 (4)	Nadir	__mA	N/A

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 5
+28V Analog Telemetry Bus (Paragraph 3.2.4.2.3)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	+28V ATB Bus Voltage (V_{at}) (Measured)	____Volts	28.0 ±.5	
3	Av. Current (I_a)	____mA	7 mA max	
4	+28V ATB Bus Power = I_a X V_{at}	____mW	200 mW max	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 6
+10V Interface Bus Voltage (Paragraph 3.2.4.2.4.1)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	Av. Current (I_a)	____mA	10 ma max	
3	+10V Interface Bus (V_{ib}) (Measured)	____Volts	9.0 ±1.0 V	
4	+10 Interface Bus Power = I_a X V_{ib}	____mW	100 mW max	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 7
1.248 MHz Clock Signal Verification (Paragraph 3.2.4.3.2.1)

1.248 CLOCK SIGNAL
ATTACH PHOTOGRAPH OR PLOT HERE

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
5	Clock Frequency	____MHz	1.248 ±10%	
	Clock Amplitude	____Volts	9.0 ±1.0V	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 8
"C1" Shift Pulse Verification (Paragraph 3.2.4.3.2.2)

"C1" SHIFT PULSE
ATTACH PHOTOGRAPH OR PLOT HERE

Parameter	Measured/ Calculated	Required	Pass/ Fail
Pulse Timing (A) *	____µs	48 µs ± 10%	
Pluse Timing (B) *	____µs	12 µs ± 10%	
Pulse Amplitude	____Volts	9.0 ± 1.0V	

* Refer to Figure 18 for location of the pulse timing A and B.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 9
"A1" Select Pulse Verification (Paragraph 3.2.4.3.2.3)

"A1" SELECT PULSE
ATTACH PHOTOGRAPH OR PLOT HERE

Parameter	Measured/ Calculated	Required	Pass/ Fail
Select Pulse Timing (F) *	____ µs	961.5 µs± 10%	
Select Pulse Amplitude	___ Volts	9.0 ±1.0V	

* Refer to Figure 18 for location of the pulse timing F

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 10
"8 Seconds" Frame Sync Pulse (Paragraph 3.2.4.3.2.4)

"8 SECONDS" FRAME SYNC PULSE
ATTACH PHOTOGRAPH OR PLOT HERE

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
1*	Frame Sync Pulse Timing	___ Sec	8 Sec ±10%	
	Frame Sync Pulse Timing (C)**	___ μs	240.4 μs ±10%	
	Frame Sync Pulse Amplitude	___ Volts	9.0 ±1.0V	

* Measure timing of 8-sec FSP by using HP 5316A Universal Counter.
** Refer to Figure 18 for location of the timing pulses for C.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Quality Control Date
(Flight Hardware Only)

TEST DATA SHEET 11 (Sheet 1 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 8 seconds Frame sync pulse.

ATTACH PHOTOGRAPH OR PLOT HERE

Verify that the timing between H and I is as shown in Figure 18.

TIME MEASURED: __________

TIME REQUIRED: 13.7 ms ±10%

PASS/FAIL ____________________

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: ________ S/N: ________
Circle Test: 1st CPT Final CPT Sub CPT ________

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control Date

TEST DATA SHEET 11 (Sheet 2 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the C1 Shift pulse.

ATTACH PHOTOGRAPH OR PLOT HERE

Verify that the timing between I and E is as shown in Figure 18.

TIME MEASURED: __________

TIME REQUIRED: 24 μs ±10%

PASS/FAIL ____________________

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

____
Quality Control

____
Customer Representative Date
Date
(Flight Hardware Only)

TEST DATA SHEET 12
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 1.248 MHz clock.

ATTACH PHOTOGRAPH OR PLOT HERE

Verify that the timing between I and J is as shown in Figure 18.

PASS/FAIL ______________________

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

______________________________ ______________________________
Customer Representative Date Quality Control Date
(Flight Hardware Only)

TEST DATA SHEET 13
Commands and Digital-B Telemetry Verification (Paragraphs 3.2.4.3.3.1, 3.2.4.3.3.2, and 3.2.4.3.3.3)

Test	Digital-B Commands Verification Via STE			Visual Inspection		Pass/Fail
	Command	Observed	Required	Observed	Required	
3.2.4.3.3.1 Module Totally Off	Scanner A2 Module Power Survival Htr. Power.		OFF Disconnect OFF	 N/A	Antenna pointing to warm load. N/A 28V supply current=0	
3.2.4.3.3.2 Survival Heater Power	Survival Heater ON Survival Heater OFF		ON OFF	N/A N/A	N/A N/A	
3.2.4.3.3.3 Module Power Connect	Module Power		Connect		+28V DC current is between 0.5 and 3.2 amps.	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

______________________________ Date
Customer Representative
Date
(Flight Hardware Only)

____
Quality Control

TEST DATA SHEET 14

Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 1)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		ON	
	4 Compensator Motor Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________

Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 15
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 2)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		OFF	
	4 Compensator Motor Power		OFF	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 16

Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 3)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		ON	
	4 Compensator Motor Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: ________ S/N: ________

Circle Test: 1st CPT Final CPT Sub CPT ________

Test Systems Engineer Date

Quality Control

Customer Representative Date

Date

(Flight Hardware Only)

TEST DATA SHEET 17
Scanner Positions Commands (Paragraph 3.2.4.3.3.5)

Test	Digital "B" Verification				Pass/Fail
	Step/Description		Observed	Required	
Scanner Position Commands	1-Warm Cal.			YES	
	3-Cold Cal. Pos.	MSB		0	
		LSB		1	
	5-Cold Cal. Pos.	MSB		1	
		LSB		0	
	7-Cold Cal. Pos.	MSB		1	
		LSB		1	
	9-Cold Cal. Pos.	MSB		0	
		LSB		0	
	11-NADIR			YES	
	13-Warm Cal			YES	

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 18
Digital-A Data Output Full Scan Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		2	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

* AMSU A2 Identification Words (data entered in decimal system)

	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: ________ S/N: ________
Circle Test: 1st CPT Final CPT Sub CPT ________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 19
Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

BP	A2 Reflector		
	Position*	Required**	Pass/Fail
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
CC			
WC			

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position data from TDS 6 of AE-26002/2 ±5 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

____
Customer Representative Date
Date
(Flight Hardware Only)

____
Quality Control

TEST DATA SHEET 20
Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

BP	Channel-1 (23.8 GHz)			Channel-2 (31.4 GHz)		
	Measured*	Required**	Pass/Fail	Measured*	Required**	Pass/Fail
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
CC						
WC						

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 21
Full Scan Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.1)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor		25 ± 15	
0264	Feedhorn		25 ± 15	
0266	RF Mux		25 ± 15	
0268	Mixer I.F. Amp. Channel 1		25 ± 15	
0270	Mixer I.F. Amp. Channel 2		25 ± 15	
0272	Local Oscillator Channel 1		25 ± 15	
0274	Local Oscillator Channel 2		25 ± 15	
0276	Compensation Motor		25 ± 15	
0278	Subreflector		25 ± 15	
0280	DC/DC Converter		25 ± 15	
0282	RF Shelf		25 ± 15	
0284	Detector/Preamp Assembly		25 ± 15	
0286	Warm Load Center		25 ± 15	
0288	Warm Load 1		25 ± 15	
0290	Warm Load 2		25 ± 15	
0292	Warm Load 3		25 ± 15	
0294	Warm Load 4		25 ± 15	
0296	Warm Load 5		25 ± 15	
0298	Warm Load 6		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 22
Digital-A Data Output Warm Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.2)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		4	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date

Quality Control
Date
(Flight Hardware Only)

TEST DATA SHEET 23

Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, 3.2.4.3.4.4)

BP	Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2, Step 5			
CC	3.2.4.3.4.3, Step 5			
	a.			
	b.			
	c.			
	d.			
15	3.2.4.3.4.4, Step 5			

WC = Warm Load
CC = Cold Load
15 = Nadir Position

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position data from TDS 6 of AE-26002/2 ±5 counts.

3.2.4.3.4.3, Step 5 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 24

Digital-A Data Output Warm Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.2)

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014				0016			
02	0022				0024			
03	0030				0032			
04	0038				0040			
05	0046				0048			
06	0054				0056			
07	0062				0064			
08	0070				0072			
09	0078				0080			
10	0086				0088			
11	0094				0096			
12	0102				0104			
13	0110				0112			
14	0118				0120			
15	0126				0128			
16	0134				0136			
17	0142				0144			
18	0150				0152			
19	0158				0160			
20	0166				0168			
21	0174				0176			
22	0182				0184			
23	0190				0192			
24	0198				0200			
25	0206				0208			
26	0214				0216			
27	0222				0224			
28	0230				0232			
29	0238				0240			
30	0246				0248			
CC	0258		0		0260		0	
WC	0310		0		0312		0	

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 25

Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor		25 ± 15	
0264	Feedhorn		25 ± 15	
0266	RF Mux		25 ± 15	
0268	Mixer I.F. Amp. Channel 1		25 ± 15	
0270	Mixer I.F. Amp. Channel 2		25 ± 15	
0272	Local Oscillator Channel 1		25 ± 15	
0274	Local Oscillator Channel 2		25 ± 15	
0276	Compensation Motor		25 ± 15	
0278	Subreflector		25 ± 15	
0280	DC/DC Converter		25 ± 15	
0282	RF Shelf		25 ± 15	
0284	Detector/Preamp Assembly		25 ± 15	
0286	Warm Load Center		25 ± 15	
0288	Warm Load 1		25 ± 15	
0290	Warm Load 2		25 ± 15	
0292	Warm Load 3		25 ± 15	
0294	Warm Load 4		25 ± 15	
0296	Warm Load 5		25 ± 15	
0298	Warm Load 6		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 26
Digital-A Data Output Cold Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.3)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		8	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 27

Digital-A Data Output Cold Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.3)
Condition: Cold Cal Position MSB=0 and Cold Cal Position LSB=0

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014				0016			
02	0022				0024			
03	0030				0032			
04	0038				0040			
05	0046				0048			
06	0054				0056			
07	0062				0064			
08	0070				0072			
09	0078				0080			
10	0086				0088			
11	0094				0096			
12	0102				0104			
13	0110				0112			
14	0118				0120			
15	0126				0128			
16	0134				0136			
17	0142				0144			
18	0150				0152			
19	0158				0160			
20	0166				0168			
21	0174				0176			
22	0182				0184			
23	0190				0192			
24	0198				0200			
25	0206				0208			
26	0214				0216			
27	0222				0224			
28	0230				0232			
29	0238				0240			
30	0246				0248			
CC	0258		0		0260		0	
WC	0310		0		0312		0	

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 28
Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor		25 ± 15	
0264	Feedhorn		25 ± 15	
0266	RF Mux		25 ± 15	
0268	Mixer I.F. Amp. Channel 1		25 ± 15	
0270	Mixer I.F. Amp. Channel 2		25 ± 15	
0272	Local Oscillator Channel 1		25 ± 15	
0274	Local Oscillator Channel 2		25 ± 15	
0276	Compensation Motor		25 ± 15	
0278	Subreflector		25 ± 15	
0280	DC/DC Converter		25 ± 15	
0282	RF Shelf		25 ± 15	
0284	Detector/Preamp Assembly		25 ± 15	
0286	Warm Load Center		25 ± 15	
0288	Warm Load 1		25 ± 15	
0290	Warm Load 2		25 ± 15	
0292	Warm Load 3		25 ± 15	
0294	Warm Load 4		25 ± 15	
0296	Warm Load 5		25 ± 15	
0298	Warm Load 6		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

______________________________ ______________________________
Customer Representative Date Quality Control Date
(Flight Hardware Only)

TEST DATA SHEET 29
Digital-A Data Output Nadir Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.4)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		16	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

*	AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
	AMSU-A2 S/N 101	00000010	2
	AMSU-A2 S/N 102	00000110	6
	AMSU-A2 S/N 103	00001010	10
	AMSU-A2 S/N 104	00001110	14
	AMSU-A2 S/N 105	00010010	18
	AMSU-A2 S/N 106	00010110	22
	AMSU-A2 S/N 107	00011010	26
	AMSU-A2 S/N 108	00011110	30
	AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

__________________________ __________________________
Customer Representative Date Quality Control
Date
(Flight Hardware Only)

TEST DATA SHEET 30
Digital-A Data Output Nadir Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.4)

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014				0016			
02	0022				0024			
03	0030				0032			
04	0038				0040			
05	0046				0048			
06	0054				0056			
07	0062				0064			
08	0070				0072			
09	0078				0080			
10	0086				0088			
11	0094				0096			
12	0102				0104			
13	0110				0112			
14	0118				0120			
15	0126				0128			
16	0134				0136			
17	0142				0144			
18	0150				0152			
19	0158				0160			
20	0166				0168			
21	0174				0176			
22	0182				0184			
23	0190				0192			
24	0198				0200			
25	0206				0208			
26	0214				0216			
27	0222				0224			
28	0230				0232			
29	0238				0240			
30	0246				0248			
CC	0258		0		0260		0	
WC	0310		0		0312		0	

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control Date

TEST DATA SHEET 31
Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor		25 ± 15	
0264	Feedhorn		25 ± 15	
0266	RF Mux		25 ± 15	
0268	Mixer I.F. Amp. Channel 1		25 ± 15	
0270	Mixer I.F. Amp. Channel 2		25 ± 15	
0272	Local Oscillator Channel 1		25 ± 15	
0274	Local Oscillator Channel 2		25 ± 15	
0276	Compensation Motor		25 ± 15	
0278	Subreflector		25 ± 15	
0280	DC/DC Converter		25 ± 15	
0282	RF Shelf		25 ± 15	
0284	Detector/Preamp Assembly		25 ± 15	
0286	Warm Load Center		25 ± 15	
0288	Warm Load 1		25 ± 15	
0290	Warm Load 2		25 ± 15	
0292	Warm Load 3		25 ± 15	
0294	Warm Load 4		25 ± 15	
0296	Warm Load 5		25 ± 15	
0298	Warm Load 6		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 32

Analog Telemetry Verification by Way of Connector J6 (Paragraph 3.2.4.3.5.1)

From	Description	To	Measured (volts)	Required (volts)	Pass/Fail
J6-02	RF Shelf A2 Temp.	J1-10	______	3.5V ± 2V	______
J6-03	Comp. Motor Temp.	J1-10	______	3.5V ± 2V	______
J6-04	Warm Load A2 Temp.	J1-10	______	3.5V ± 2V	______
J6-22	A2 Scan Motor Temp.	J1-10	______	3.5V ± 2V	______
J6-08	Scan Motor Curr.	J2-03	______	2.0V ± 1.0V	______
J6-09	+15V Antenna Drive	J2-03	______	3.5V ± 0.5V	______
J6-10	+5V Antenna Drive	J2-03	______	3.0V ± 0.5V	______
J6-11	+15V Signal Processing	J2-03	______	3.5V ± 0.25V	______
J6-12	+5V Signal Processing	J2-03	______	3.0V ± 0.25V	______
J6-13	L.O. Voltage Channel 1	J2-03	______	3.5V ± 0.5V	______
J6-27	Comp Motor Current	J2-03	______	2.0V ± 1.0V	______
J6-28	-15V Antenna Drive	J2-03	______	3.0V ± 0.5V	______
J6-29	-15V Signal Processing	J2-03	______	3.0V ± 0.25V	______
J6-30	L.O. Voltage Channel 2	J2-03	______	3.5V ± 0.5V	______
J6-34	Mixer/IF Voltage	J2-03	______	3.5V ± 0.5V	______

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________

Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

____
Customer Representative Date
Date
(Flight Hardware Only)

____
Quality Control

TEST DATA SHEET 33

Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

Description	*	Measured (Deg. C)	Required (Deg. C)	Pass/Fail
A2 Scanner Motor	Temp	______	25 ± 15	______
A2 RF Shelf A2 Temp.	Temp	______	25 ± 15	______
A2 Warm Load	Temp	______	25 ± 15	______
A2 Compensator Motor	Temp	______	25 ± 15	______
		(mAmps)	(mAmps)	
Ant A2 Drv Motor Current		______	150 mA max	______
Ant A2 Comp. Motor Current		______	150 mA max	______
		(Volts)	(Volts)	
Signal Processor	+15V	______	15.0V ± 0.75V	______
Antenna Drive	+15V	______	15.0V ± 1.5V	______
Signal Processor	-15V	______	-15.0V ± 0.75V	______
Antenna Drive	-15V	______	-15.0V ± 1.5V	______
Mixer/IF	***	______	***____ ± 0.5V	______
Signal Processor	+5V	______	5.0V ± 0.5V	______
Antenna Drive	+5V	______	5.0V ± 0.6V	______
L.O. #1	**	______	**____ ± 0.5V	______
L.O. #2	**	______	**____ ± 0.5V	______

* Data from the printout sheet Page 8. Rewriting data on this space is optional.
** L.O. voltages from manufacturer data sheet for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.
*** Mixer/IF voltage: +8V for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

____
Test Systems Engineer Date

____________________________________ ____________________________________
Customer Representative Date Quality Control
Date
(Flight Hardware Only)

TEST DATA SHEET 34

Integrate/Hold and Dump Signal Verification (Paragraph 3.2.4.3.6.1)

ATTACH PHOTOGRAPH OR PLOT HERE

Parameter	Measured	Required	Pass/ Fail
Scope Channel-1: Integration/Hold			
Time (A)*	ms	158 ms ± 10%	
Time (B)*	ms	42 ms ± 10%	
Amplitude	V	5.0 V ± 0.2V	
Scope Channel-2: Dump Signal			
Time (D)*	ms	9 ms to 15 ms	
Amplitude	V	5.0 V ± 0.2V	

* Refer to Figure 2 for waveform configuration.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________

Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date

Date

(Flight Hardware Only)

Quality Control

TEST DATA SHEET 35
Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)

ATTACH PHOTOGRAPH OR PLOT HERE

J7 - pin 8 signal
Frequency: 23.8 GHz

INTEGRATION (X) *
Measured ___________ ms
Required 158 ms ± 10%
Pass/Fail ___________

HOLD (B-D) **
Measured ___________ ms
Required 32 ms ± 10%
Pass/Fail ___________

DUMP (D) *
Measured ___________ ms
Required 9 ms to 15 ms
Pass/Fail ___________

ATTACH PHOTOGRAPH OR PLOT HERE

J7 - pin 9 signal
Frequency: 31.4 GHz

INTEGRATION (X) *
Measured ___________ ms
Required 158 ms ± 10%
Pass/Fail ___________

HOLD (B-D) **
Measured ___________ ms
Required 32 ms ± 10%
Pass/Fail ___________

DUMP (D) *
Measured ___________ ms
Required 9 ms to 15 ms
Pass/Fail ___________

* Refer to Figure 2 for waveform configuration.
** Refer to Data Sheet 34 and Figure 2.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET 36
Digital-A/GSE Mode-1 Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.7.2)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		0	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200   Shop Order: __________   S/N: __________
Circle Test: 1st CPT   Final CPT   Sub CPT __________

____
Test Systems Engineer   Date

____
Quality Control   Date

TEST DATA SHEET 37 (Sheet 1 of 2)
Digital A/GSE Modes-1-4 Reflector Position Section [IV] (Paragraphs 3.2.4.3.7.2 - 3.2.4.3.7.5)

3.2.4.3.7.2 Digital A/GSE Mode-1 Reflector Position Section [IV]

BP	Reflector			
	Note	Position*	Required**	Pass/Fail
06	1st 10 data			
WC	2nd 10 data			
CC	3rd 10 data			

3.2.4.3.7.3 Digital A/GSE Mode-2 Reflector Position Section [IV]

BP	Reflector		
	Position*	Required**	Pass/Fail
01			

3.2.4.3.7.4 Digital A/GSE Mode-3 Reflector Position Section [IV]

BP	Reflector		
	Position*	Required**	Pass/Fail
***			

3.2.4.3.7.5 Digital A/GSE Mode-4 Reflector Position Section [IV]

BP	Reflector		
	Position*	Required**	Pass/Fail
30			

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position from TDS 6 of AE-26002/2 ±5 counts.
*** Current Position

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

(Flight Hardware Only)

TEST DATA SHEET 37 (Sheet 2 of 2)
Digital A/GSE Modes-1-4 Reflector Position Section [IV] (Paragraphs 3.2.4.3.7.2 - 3.2.4.3.7.5)

3.2.4.3.7.6 Digital A/GSE Mode-5 Reflector Position Section [IV]

BP	Reflector		
	Position*	Required**	Pass/Fail
06			

3.2.4.3.7.7 Digital A/GSE Mode-7 Reflector Position Section [IV]

BP	Reflector		
	Position*	Required**	Pass/Fail
06			

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position from TDS 6 of AE-26002/2 ±5 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control Date

TEST DATA SHEET 38
Digital A/GSE Mode-1 Radiometer Data Section [V] (Paragraph 3.2.4.3.7.2)

BP	Channel-1 (23.8 GHz)		
	Measured*	Required**	Pass/Fail
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
CC		0	
WC		0	

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Quality Control Date

TEST DATA SHEET 39
Digital A/GSE Mode-1 Temperature Sensors Section [VI] (Paragraph 3.2.4.3.7.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor		25 ± 15	
0264	Feedhorn		25 ± 15	
0266	RF Mux		25 ± 15	
0268	Mixer I.F. Amp. Channel 1		25 ± 15	
0270	Mixer I.F. Amp. Channel 2		25 ± 15	
0272	Local Oscillator Channel 1		25 ± 15	
0274	Local Oscillator Channel 2		25 ± 15	
0276	Compensation Motor		25 ± 15	
0278	Subreflector		25 ± 15	
0280	DC/DC Converter		25 ± 15	
0282	RF Shelf		25 ± 15	
0284	Detector/Preamp Assembly		25 ± 15	
0286	Warm Load Center		25 ± 15	
0288	Warm Load 1		25 ± 15	
0290	Warm Load 2		25 ± 15	
0292	Warm Load 3		25 ± 15	
0294	Warm Load 4		25 ± 15	
0296	Warm Load 5		25 ± 15	
0298	Warm Load 6		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer ______ Date ______

Quality Control ______ Date ______

TEST DATA SHEET 40

Radiometer Relative NEΔT Verification (Paragraph 3.2.4.4.1.2)

Channel	Channel 1	Channel 2
NEΔT (Average of 5 data)		
NEΔT (specified)*	0.30 K	0.30 K
Pass/Fail**		

* For reference only.
** Use first CPT or first LPT data along with specified value for pass fail criteria.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET NO. 40A
Channel Identification Test (Paragraph 3.2.4.4.2)

Channel Number	Sweeper Frequency Setting (GHz)	Polarization (H/V)	Radiometric Data (Δ Counts)	Channel Verified (Yes/No)
1	23.8	V		

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date Quality Control Date
(Flight Hardware Only)

TEST DATA SHEET 41
Transient Susceptibility Test (Paragraphs 3.2.4.2.1.3, 3.2.4.2.2.9, 3.2.4.2.3.3)

Test Setup Verified: ____________________
Signature

3.2.4.2.1.3 +28V Main Bus Load-Induced Transient Test

Subpara	Step	Load Induced Transient	Functional Performance Results/Deviations	Comments/ Observations
3.2.4.2.1.3.2	8	Low frequency in accordance with Figure 7		
3.2.4.2.1.3.3	14	High frequency in accordance with Steps 7, 9, 11, and 13		

3.2.4.2.2.9 +28V Pulse Load Bus Load-Induced Transient Test

Subpara	Step	Load Induced Transient	Functional Performance Results/Deviations	Comments/ Observations
3.2.4.2.2.9.2	8	Low frequency in accordance with Figure 12		
3.2.4.2.2.9.3	14	High frequency in accordance with Steps 7, 9, 11, and 13		

3.2.4.2.3.3 +28V Analog Telemetry Bus Load-Induced Transient Test

Subpara	Step	Load Induced Transient	Functional Performance Results/Deviations	Comments/ Observations
3.2.4.2.3.3.2	8	Low frequency in accordance with Figure 7		
3.2.4.2.3.3.3	14	High frequency in accordance with Steps 7, 9, 11, and 13		

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: __________ S/N: __________
Circle Test: 1st CPT Final CPT Sub CPT __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

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APPENDIX B

TEST DATA SHEETS FOR AMSU-A2 SYSTEM LPT

This appendix contains the test data sheets for the LPT tests and inspections listed in section 3.

TEST DATA SHEET B-1 (SHEET 1 OF 9)
Grounding Test (Paragraph 3.2.4.1)

J1 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	+28V MLB	> 100k		
J1-2	+28V MLB	> 100k		
J1-3	+28V MLB RTN	> 100k		
J1-4	+28V MLB RTN	> 100k		
J1-5	+28V PLB	> 100k		
J1-6	+28V PLB	> 100k		
J1-7	+28V PLB RTN	> 100k		
J1-8	+28V PLB RTN	> 100k		
J1-9	+28V TMB	> 100k		
J1-10	28V TMB RTN	> 100k		
J1-11	NO CONNECTION	> 100k		
J1-12	NO CONNECTION	> 100k		
J1-13	CHASSIS GROUND (E1)	< 1		
J1-14	+28V MLB	> 100k		
J1-15	+28V MLB	> 100k		
J1-16	+28V MLB RTN	> 100k		
J1-17	+28V MLB RTN	> 100k		
J1-18	+28V PLB	> 100k		
J1-19	+28V PLB	> 100k		
J1-20	+28V PLB RTN	> 100k		
J1-21	+28V PLB RTN	> 100k		
J1-22	+28V TMB	> 100k		
J1-23	28V TMB RTN	> 100k		
J1-24	SAFETY HTR PWR	> 100k		
J1-25	SAFETY HTR RTN	> 100k		

TEST DATA SHEET B-1 (Sheet 2 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

J2 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-1	Chassis Ground (E2)	< 1		
J2-2	DATA CLOCK (C1)	> 100k		
J2-3	Signal Return	> 100k		
J2-4	No Connection	> 100k		
J2-5	DIGITAL A DATA OUT	> 100k		
J2-6	DATA ENABLE (A1)	> 100k		
J2-7	8 SEC SYNC PULSE	> 100k		
J2-8	No Connection	> 100k		
J2-9	No Connection	> 100k		

J3 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J3-1	1.248 MHz CLK	> 100k		
J3-2	1.248 MHz CLK RTN	> 100k		
J3-3	Chassis GND (E3)	< 1		

J5 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J5-1	Chassis Ground (E5)	< 1		
J5-2	MODULE PWR IND	> 100k		
J5-3	COLD CAL POS MSB (OUT)	> 100k		
J5-4	No Connection	> 100k		
J5-5	COMP MTR IND	> 100k		
J5-6	ANT IN COLD CAL POS	> 100k		
J5-7	No Connection	> 100k		
J5-8	No Connection	> 100k		
J5-9	SURV HTR ON/OFF	> 100k		
J5-10	No Connection	> 100k		
J5-11	COLD CAL POS LSB (OUT)	> 100k		
J5-12	SCANNER ON PWR IND	> 100k		
J5-13	ANT IN WARM CAL POS	> 100k		
J5-14	ANT AT NADIR POS	> 100k		
J5-15	FULL SCAN MODE	> 100k		

TEST DATA SHEET B-1 (Sheet 3 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

J4 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J4-1	Chassis Ground (E4)	< 1		
J4-2	MODULE PWR DISCONN	> 100k		
J4-3	SURVIVAL HTR ON	> 100k		
J4-4	MODULE TOTALLY OFF	> 100k		
J4-5	COMP MTR ON/OFF	> 100k		
J4-6	ANT AT COLD CAL POS	> 100k		
J4-7	No Connection	> 100k		
J4-8	ANT AT NADIR POS	> 100k		
J4-9	COLD CAL POS MSB (IN)	> 100k		
J4-10	No Connection	> 100k		
J4-11	No Connection	> 100k		
J4-12	+10V INTERFACE BUS	> 100k		
J4-13	10V INTERFACE BUS RTN	> 100k		
J4-14	MODULE PWR CONN	> 100k		
J4-15	SURVIVAL HTR OFF	> 100k		
J4-16	SCANNER PWR ON/OFF	> 100k		
J4-17	ANT AT WARM CAL POS	> 100k		
J4-18	FULL SCAN	> 100k		
J4-19	COLD CAL POS LSB (IN)	> 100k		
J4-20	No Connection	> 100k		
J4-21	No Connection	> 100k		
J4-22	No Connection	> 100k		
J4-23	No Connection	> 100k		
J4-24	+10V INTERFACE BUS	> 100k		
J4-25	10V INTERFACE BUS RTN	> 100k		

TEST DATA SHEET B-1 (Sheet 4 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

J6 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-1	Chassis GND (E6)	< 1		
J6-2	RF SHELF TEMP	> 100k		
J6-3	COMP. MTR. TEMP	> 100k		
J6-4	WARM LOAD TEMP	> 100k		
J6-5	No Connection	> 100k		
J6-6	No Connection	> 100k		
J6-7	No Connection	> 100k		
J6-8	SCAN MTR CURR	> 100k		
J6-9	+15V ANT DR MON	> 100k		
J6-10	+15V ANT DR MON	> 100k		
J6-11	+15V SIG PROC MON	> 100k		
J6-12	+15V SIG PROC MON	> 100k		
J6-13	L.O. #1 MON	> 100k		
J6-14	No Connection	> 100k		
J6-15	No Connection	> 100k		
J6-16	No Connection	> 100k		
J6-17	No Connection	> 100k		
J6-18	No Connection	> 100k		
J6-19	No Connection	> 100k		
J6-20	28V TMB RTN	> 100k		
J6-21	No Connection	> 100k		
J6-22	SCAN MTR TEMP	> 100k		
J6-23	No Connection	> 100k		
J6-24	No Connection	> 100k		
J6-25	No Connection	> 100k		
J6-26	No Connection	> 100k		
J6-27	COMP MTR CURR	> 100k		
J6-28	-15V ANT DR MON	> 100k		
J6-29	-15V SIG PROC MON	> 100k		
J6-30	L.O. #2 MON	> 100k		
J6-31	No Connection	> 100k		
J6-32	No Connection	> 100k		
J6-33	No Connection	> 100k		
J6-34	MIXER/AMP MON	> 100k		
J6-35	No Connection	> 100k		
J6-36	No Connection	> 100k		
J6-37	No Connection	> 100k		

TEST DATA SHEET B-1 (Sheet 5 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

J7 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J7-1	Chassis GND (E7)	< 1		
J7-2	No Connection	> 100k		
J7-3	No Connection	> 100k		
J7-4	No Connection	> 100k		
J7-5	15V RTN (2/3)	> 100k		
J7-6	DUMP TP	> 100k		
J7-7	No Connection	> 100k		
J7-8	CH1 ANALOG OUT TP	> 100k		
J7-9	CH2 ANALOG OUT TP	> 100k		
J7-10	No Connection	> 100k		
J7-11	No Connection	> 100k		
J7-12	No Connection	> 100k		
J7-13	No Connection	> 100k		
J7-14	No Connection	> 100k		
J7-15	No Connection	> 100k		
J7-16	No Connection	> 100k		
J7-17	GSE CMD LSB	> 100k		
J7-18	GSE CMD MSB-1	> 100k		
J7-19	+5VDC GSE INTERLOCK A	> 100k		
J7-20	No Connection	> 100k		
J7-21	No Connection	> 100k		
J7-22	No Connection	> 100k		
J7-23	I/H TP	> 100k		
J7-24	No Connection	> 100k		
J7-25	No Connection	> 100k		
J7-26	15V RTN (2/3)	> 100k		
J7-27	No Connection	> 100k		
J7-28	No Connection	> 100k		
J7-29	No Connection	> 100k		
J7-30	No Connection	> 100k		
J7-31	No Connection	> 100k		
J7-32	No Connection	> 100k		
J7-33	No Connection	> 100k		
J7-34	No Connection	> 100k		
J7-35	GSE CMD MSB	> 100k		
J7-36	5V RTN (1)	> 100k		
J7-37	+5VDC GSE INTERLOCK B	> 100k		

TEST DATA SHEET B-1 (Sheet 6 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	J1-2	+28V MLB	< 1		
J1-1	J1-14	+28V MLB	< 1		
J1-1	J1-15	+28V MLB	< 1		
J1-3	J1-4	28V MLB RTN	< 1		
J1-3	J1-16	28V MLB RTN	< 1		
J1-3	J1-17	28V MLB RTN	< 1		
J1-5	J1-6	+28V PLB	< 1		
J1-5	J1-18	+28V PLB	< 1		
J1-5	J1-19	+28V PLB	< 1		
J1-7	J1-8	28V PLB RTN	< 1		
J1-7	J1-20	28V PLB RTN	< 1		
J1-7	J1-21	28V PLB RTN	< 1		
J1-9	J1-22	+28V TMB	< 1		
J1-10	J1-23	28V TMB RTN	< 1		
J1-10	J6-20	28V TMB RTN	< 1		
J4-12	J4-24	+10V INTERFACE BUS	< 1		
J4-13	J4-25	10V INTERFACE BUS RTN	< 1		
J1-1	J1-3	+28V MLB	> 100k		
J1-1	J1-5	+28V MLB	> 100k		
J1-1	J1-7	+28V MLB	> 100k		
J1-1	J1-9	+28V MLB	> 100k		
J1-1	J1-10	+28V MLB	> 100k		
J1-1	J1-24	+28V MLB	> 100k		
J1-1	J1-25	+28V MLB	> 100k		
J1-1	J2-3	+28V MLB	> 100k		
J1-1	J4-12	+28V MLB	> 100k		
J1-1	J4-13	+28V MLB	> 100k		
J1-3	J1-5	28V MLB RTN	> 100k		
J1-3	J1-7	28V MLB RTN	> 100k		
J1-3	J1-9	28V MLB RTN	> 100k		
J1-3	J1-10	28V MLB RTN	> 100k		
J1-3	J1-24	28V MLB RTN	> 100k		
J1-3	J1-25	28V MLB RTN	> 100k		
J1-3	J2-3	28V MLB RTN	> 100k		
J1-3	J4-12	28V MLB RTN	> 100k		
J1-3	J4-13	28V MLB RTN	> 100k		

TEST DATA SHEET B-1 (Sheet 7 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-5	J1-7	+28V PLB	> 100k		
J1-5	J1-9	+28V PLB	> 100k		
J1-5	J1-10	+28V PLB	> 100k		
J1-5	J1-24	+28V PLB	> 100k		
J1-5	J1-25	+28V PLB	> 100k		
J1-5	J2-3	+28V PLB	> 100k		
J1-5	J4-12	+28V PLB	> 100k		
J1-5	J4-13	+28V PLB	> 100k		
J1-7	J1-9	28V PLB RTN	> 100k		
J1-7	J1-10	28V PLB RTN	> 100k		
J1-7	J1-24	28V PLB RTN	> 100k		
J1-7	J1-25	28V PLB RTN	> 100k		
J1-7	J2-3	28V PLB RTN	> 100k		
J1-7	J4-12	28V PLB RTN	> 100k		
J1-7	J4-13	28V PLB RTN	> 100k		
J1-9	J1-10	+28V TMB	> 100k		
J1-9	J1-24	+28V TMB	> 100k		
J1-9	J1-25	+28V TMB	> 100k		
J1-9	J2-3	+28V TMB	> 100k		
J1-9	J4-12	+28V TMB	> 100k		
J1-9	J4-13	+28V TMB	> 100k		
J1-10	J1-24	28V TMB RTN	> 100k		
J1-10	J1-25	28V TMB RTN	> 100k		
J1-10	J2-3	28V TMB RTN	> 100k		
J1-10	J4-12	28V TMB RTN	> 100k		
J1-10	J4-13	28V TMB RTN	> 100k		
J1-24	J1-25	SAFETY HTR PWR	> 100k		
J1-24	J2-3	SAFETY HTR PWR	> 100k		
J1-24	J4-12	SAFETY HTR PWR	> 100k		
J1-24	J4-13	SAFETY HTR PWR	> 100k		
J1-25	J2-3	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-12	SAFETY HTR PWR RTN	> 100k		
J1-25	J4-13	SAFETY HTR PWR RTN	> 100k		
J2-3	J4-12	SIGNAL RTN	> 100k		
J2-3	J4-13	SIGNAL RTN	> 100k		
J4-12	J4-13	+10V INTERFACE BUS	> 100k		

TEST DATA SHEET B-1 (Sheet 8 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-2	J4-13	DATA CLOCK (C1)	> 2k		
J2-5	J4-13	DIGITAL A DATA OUT	> 2k		
J2-6	J4-13	DATA ENABLE (A1)	> 2k		
J2-7	J4-13	8 SEC SYNC PULSE	> 2k		
J3-1	J4-13	1.248 MHZ CLK	> 2k		
J3-2	J4-13	1.248 MHZ CLK RTN	> 2k		
J4-2	J4-13	MODULE PWR DISCONN	> 2k		
J4-3	J4-13	SURVIVAL HTR ON	> 2k		
J4-4	J4-13	MODULE TOTALLY OFF	> 2k		
J4-5	J4-13	COMP MTR ON/OFF	> 2k		
J4-6	J4-13	ANT AT COLD CAL POS	> 2k		
J4-8	J4-13	ANT AT NADIR POS	> 2k		
J4-9	J4-13	COLD CAL POS MSB (IN)	> 2k		
J4-14	J4-13	MODULE PWR CONN	> 2k		
J4-15	J4-13	SURVIVAL HTR OFF	> 2k		
J4-16	J4-13	SCANNER PWR ON/OFF	> 2k		
J4-17	J4-13	ANT AT WARM CAL POS	> 2k		
J4-18	J4-13	FULL SCAN	> 2k		
J4-19	J4-13	COLD CAL POS LSB (IN)	> 2k		
J5-2	J4-13	MODULE PWR IND	> 2k		
J5-3	J4-13	COLD CAL POS MSB	> 2k		
J5-5	J4-13	COMP MTR IND	> 2k		
J5-6	J4-13	ANT IN COLD CAL POS	> 2k		
J5-9	J4-13	SURV HTR ON/OFF	> 2k		
J5-11	J4-13	COLD CAL POS LSB	> 2k		
J5-12	J4-13	SCANNER ON PWR IND	> 2k		
J5-13	J4-13	ANT IN WARM CAL POS	> 2k		
J5-14	J4-13	ANT IN NADIR POS	> 2k		
J5-15	J4-13	FULL SCAN MODE	> 2k		

TEST DATA SHEET B-1 (Sheet 9 of 9)
Grounding Test (Paragraph 3.2.4.1, Step 2)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-8	J4-13	SCAN MTR CVR	> 2k		
J6-9	J4-13	+15V ANT DR MON	> 2k		
J6-10	J4-13	+5V ANT DR MON	> 2k		
J6-11	J4-13	+15V SIG PROC MON	> 2k		
J6-12	J4-13	+5V SIG PROC MON	> 2k		
J6-13	J4-13	L.O. #1 MON	> 2k		
J6-20	J4-13	28V TMB RTN	> 2k		
J6-22	J4-13	SCAN MTR TEMP	> 2k		
J6-27	J4-13	COMP MTR CURR	> 2k		
J6-28	J4-13	-15V ANT DR MON	> 2k		
J6-29	J4-13	-15V SIG PROC MON	> 2k		
J6-30	J4-13	L.O. #2 MON	> 2k		
J6-34	J4-13	MIXER/AMP MON	> 2k		
J6-2	J1-10	RF SHELF TEMP	> 2k		
J6-3	J1-10	COMP MTR.TEMP	> 2k		
J6-4	J1-10	WARM LOAD TEMP	> 2k		

Power Input Test (Paragraph 3.2.4.2.5)

Step	Parameter	Measured	Units	Required	Pass/ Fail
3	+28 V MLB Voltage (Vb) (Measured at connector J1)		Volts	28.0 ±0.5	
3	MLB Current (STE Meter)		Amps	Between 0.5 and 4.3 Amps	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date

Quality Control

TEST DATA SHEET B-2 (See Appendix A, Test Data Sheet 13 for CPT)
Commands and Digital-B Telemetry Verification (Paragraphs 3.2.4.3.3.1, 3.2.4.3.3.2, and 3.2.4.3.3.3)

Test	Digital-B Commands Verification Via STE			Visual Inspection		Pass/Fail
	Command	Observed	Required	Observed	Required	
3.2.4.3.3.1 Module Totally Off	Scanner A2		OFF		Antenna pointing to warm load.	
	Module Power		Disconnect	N/A	N/A	
	Survival Htr. Power.		OFF		28V supply current=0	
3.2.4.3.3.2 Survival Heater Power	Survival Heater ON		ON	N/A	N/A	
	Survival Heater OFF		OFF	N/A	N/A	
3.2.4.3.3.3 Module Power Connect	Module Power		Connect		+28V DC current is between 0.5 and 3.2 amps.	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

______________________________ Test Systems Engineer Date

Customer Representative Date

Quality Control Date

TEST DATA SHEET B-3 (See Appendix A, Test Data Sheet 14 for CPT)
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 1)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		ON	
	4 Compensator Motor Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

TEST DATA SHEET B-4 (See Appendix A, Test Data Sheet 15 for CPT)
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 2)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		OFF	
	4 Compensator Motor Power		OFF	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date Quality Control Date

TEST DATA SHEET B-5 (See Appendix A, Test Data Sheet 16 for CPT)
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 3)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power		CONNECT	
	2 Survival Heater		OFF	
	3 Scanner A2 Power		ON	
	4 Compensator Motor Power		ON	
	5 Antenna Warm Cal Pos.		NO	
	6 Antenna Cold Cal Pos.		NO	
	7 Antenna NADIR Position		NO	
	8 Antenna Full Scan		YES	
	9 Cold MSB		0	
	10 Cold LSB		0	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date

Quality Control
Date

TEST DATA SHEET B-6 (See Appendix A, Test Data Sheet 17 for CPT)
Scanner Positions Commands (Paragraph 3.2.4.3.3.5)

Test	Digital "B" Verification				Pass/Fail
	Step/Description		Observed	Required	
Scanner Position Commands	1-Warm Cal.			YES	
	3-Cold Cal. Pos.	MSB		0	
		LSB		1	
	5-Cold Cal. Pos.	MSB		1	
		LSB		0	
	7-Cold Cal. Pos.	MSB		1	
		LSB		1	
	9-Cold Cal. Pos.	MSB		0	
		LSB		0	
	11-NADIR			YES	
	13-Warm Cal			YES	

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date

Quality Control Date

TEST DATA SHEET B-7 (See Appendix A, Test Data Sheet 18 for CPT)
Digital-A Data Output Full Scan Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1		255	
	0002	Sync Sequence Byte 2		255	
	0003	Sync Sequence Byte 3		255	
[II]	0004	Unit I.D. and Serial N		*	
[III]	0005	Digital B Data Byte 1		2	
	0006	Digital B Data Byte 2		6	
	0007	Digital B Data Byte 3		0	
	0008	Digital B Data Byte 4		0	

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
Date
~~(Flight Hardware Only)~~

Quality Control

TEST DATA SHEET B-8 (See Appendix A, Test Data Sheet 19 for CPT)
Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

BP	A2 Reflector		
	Position*	Required**	Pass/Fail
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
CL			
WL			

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position from TDS 6 of AE-26002/2 ±5 counts.

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
(Flight Hardware Only)

Quality Control Date

TEST DATA SHEET B-9 (See Appendix A, Test Data Sheet 20 for CPT)
Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014				0016			
02	0022				0024			
03	0030				0032			
04	0038				0040			
05	0046				0048			
06	0054				0056			
07	0062				0064			
08	0070				0072			
09	0078				0080			
10	0086				0088			
11	0094				0096			
12	0102				0104			
13	0110				0112			
14	0118				0120			
15	0126				0128			
16	0134				0136			
17	0142				0144			
18	0150				0152			
19	0158				0160			
20	0166				0168			
21	0174				0176			
22	0182				0184			
23	0190				0192			
24	0198				0200			
25	0206				0208			
26	0214				0216			
27	0222				0224			
28	0230				0232			
29	0238				0240			
30	0246				0248			
CC	0258				0260			
WL	0310				0312			

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET B-10 (See Appendix A, Test Data Sheet 21 for CPT)
Full Scan Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.1)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Warm Load 1		25 ± 15	
0264	Warm Load 2		25 ± 15	
0266	Warm Load 3		25 ± 15	
0268	Warm Load 4		25 ± 15	
0270	Warm Load 5		25 ± 15	
0272	Warm Load 6		25 ± 15	
0274	Warm Load Center		25 ± 15	
0276	Scan Motor		25 ± 15	
0278	Compensation Motor		25 ± 15	
0280	Feedhorn		25 ± 15	
0282	RF Mux		25 ± 15	
0284	Mixer I.F. Amp. Channel 1		25 ± 15	
0286	Mixer I.F. Amp. Channel 2		25 ± 15	
0288	Subreflector		25 ± 15	
0290	DC/DC Converter		25 ± 15	
0292	RF Shelf		25 ± 15	
0294	Detector/Preamp Assembly		25 ± 15	
0296	Local Oscillator Channel 1		25 ± 15	
0298	Local Oscillator Channel 2		25 ± 15	
0300	Temp Sensor V. Reference		**	

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
Date
~~(Flight Hardware Only)~~

Quality Control

TEST DATA SHEET B-11 (See Appendix A, Test Data Sheet 33 for CPT)
Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

	Description	*	Measured (Deg. C)	Required (Deg. C)	Pass/Fail
02	A2 Scanner Motor	Temp	______	25 ± 15	______
04	A2 RF Shelf A2 Temp.	Temp	______	25 ± 15	______
05	A2 Warm Load	Temp	______	25 ± 15	______
			(mAmps)	(mAmps)	
08	Ant A2 Drv Motor Current		______	150 mA max	______
			(Volts)	(Volts)	
09	Signal Processor	+15V	______	15.0V ± 0.75V	______
10	Antenna Drive	+15V	______	15.0V ± 1.5V	______
11	Signal Processor	-15V	______	-15.0V ± 0.75V	______
12	Antenna Drive	-15V	______	-15.0V ± 1.5V	______
13	Mixer/IF	***	______	***____ ± 0.5V	______
14	Signal Processor	+5V	______	5.0V ± 0.5V	______
15	Antenna Drive	+5V	______	5.0V ± 0.6V	______
19	L.O. #1	**	______	**____ ± 0.5V	______
20	L.O. #2	**	______	**____ ± 0.5V	______

* Data from the printout sheet Page 8. Rewriting data on this space is optional.
** L.O. voltages from manufacturer data sheet for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.
*** Mixer/IF voltage: +8V for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
Date
(Flight Hardware Only)

Quality Control

TEST DATA SHEET B-12 (See Appendix A, Test Data Sheet 40 for CPT)
Radiometer Relative NEΔT Verification (Paragraph 3.2.4.4.1)

Channel	Channel 1	Channel 2
NEΔT (Average of 5 data)		
NEΔT (specified)*	0.30 K	0.30 K
Pass/Fail**		

* For reference only.
** Use first CPT or first LPT data along with specified value for pass fail criteria.

METSAT/AMSU A2 System LPT P/N IS-1331200 Shop Order: __________ S/N: __________

Test Systems Engineer Date

Customer Representative Date
Date

Quality Control

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DOCUMENT APPROVAL SHEET

TITLE	DOCUMENT NO.
Process Specification METSAT/KLM/AMSU-A2, System Comprehensive and Limited Performance Tests Test Procedure	AE-26156/4E 2 April 1999

INPUT FROM:	DATE	CDRL:	SPECIFICATION ENGINEER:	DATE
			J.M. Wish	99-04-03
CHECKED BY: E.A. Haeppola	DATE 4/5/99		JOB NUMBER:	DATE

APPROVED SIGNATURES		DEPT. NO.	DATE
System Safety (W. Neighbors)	W. A. Neighbors	8331	4/6/99
Product Team Leader (A. Nieto)	A. Nieto	8341	4/6/99
~~Systems~~ Engineer (~~R. Platt~~)	P. K. Patel	8311	4/6/99
Design Assurance (E. Lorenz)	D. Wong (for E. Lorenz)	8331	4/5/99
Quality Assurance (R. Taylor)	[illegible] (for R. Taylor)	7831	4/6/99
Technical Director/PMO (P. Patel)	P. K. Patel	8341	4/6/99
Released: Configuration Management (J. Cavanaugh)	J. Cavanaugh	8361	4/6/99

Approved as Final per customer's letter dated 6 April 1999 (ECN's CAMSU-2087 and CAMSU-2099)

By my signature, I certify the above document has been reviewed by me and concurs with the technical requirements related to my area of responsibility.

(Data Center) FINAL Laura Noragio 4-7-99

3. REQUIREMENTS

3.1 *General test requirements*

3.1.1 ***Equipment and test facilities.*** The tests described herein shall be performed at Aerojet under laboratory conditions in an EMI shielded chamber for the first and final CPT. Other tests need not be accomplished in the EMI shielded chamber. The test equipment listed in Table I shall be used when performing the tests. If the specified equipment is not available, the equipment substituted shall provide a measurement accuracy equal to or greater than that of the specified equipment. The AMSU-A Special Test Equipment (STE) shall be used for activation and control of the unit and monitoring of its performance.

Table I. Equipment List

Item	Quantity	Item Description	Mfg.	Model
01	1	Dynamic signal analyzer	Hewlett-Packard	3562A
02	1	Signal generator	Hewlett-Packard	3314A
03	1	Oscilloscope	Tektronix	2225A
04	1	9-pin breakout box	Aerojet	2536-3743/SK1358702-1
05	1	15-pin breakout box	Aerojet	2536-3744/SK1358703-1
06	2	25-pin breakout box	Aerojet	2336-3746/SK1358704-1
07	1	37-pin breakout box	Aerojet	2536-3745/SK1358705-1
08	1	Lab. general purpose power supply	Hewlett-Packard	6114
09	1	LN_2 container	Cole	N03726-20
10	1	Spectrum analyzer	Hewlett-Packard	8590L
11	1	STE computer	Aerojet	1336695/SK1356655
12	1	STE interface cable J1	Aerojet	1335758-1
13	1	STE interface cable J2	Aerojet	1335752-1
14	1	STE interface cable J3	Aerojet	1335756-1
15	1	STE interface cable J4	Aerojet	1335755-1
16	1	STE interface cable J5	Aerojet	1335753-1
17	1	STE interface cable J6	Aerojet	1335754-1
18	1	STE interface cable J7	Aerojet	1335757-1
19	1	Current probe amp	Hewlett-Packard	AM503
20	1	Universal counter	Hewlett-Packard	5316A
21	1	Oscilloscope camera	N/A	N/A
22	1	Power supply	Power Designs	3650-S
23	1	Multimeter	Fluke	77
24	1	Plotter	Hewlett-Packard	7475A
25	1	Signal generator	Hewlett-Packard	83620B
26	1	MM-wave source module	Hewlett-Packard	83557A
27	1	Couple/detector	Hewlett-Packard	83557-60001
28	1	Spectrum analyzer	Hewlett-Packard	8563E

* For limited performance test only; item numbers 04, 06, 09, 11 through 18, and 23 are required.

3.1.2 ***Required procedures and operations***. The unit shall be subjected to the examinations and tests specified in 3.2.4 and Table II.

3.1.2.1 ***Limited performance test (LPT)***. The Limited Performance Test shall consist of the test procedures specified in the LPT column of Table II.

3.1.2.2 ***Comprehensive performance test (CPT)***. Three versions of the Comprehensive Performance Test are identified in Table II. These are applicable for different test stages. The test procedures to be performed for each version are specified in the 1st CPT, Sub CPT, and Final CPT columns of Table II.

Table II. AMSU-A2 Performance Tests

Paragraph	Test Description	1st CPT	LPT	Sub CPT	Final CPT
3.2.4.1	Grounding Test	X	X	X	X
3.2.4.2.1.1	+28 Main Load Bus (MLB) Turn-On Transient	X			X
3.2.4.2.1.2	+28 MLB Operating Power	X	Note 1	Note 2	X
3.2.4.2.1.3	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.1.4	Instrument Feedback Test	Note 7			
3.2.4.2.2	+28 Pulse Load Bus (PLB) Test	X		Note 3	X
3.2.4.2.2.8	Instrument Feedback Test	Note 7			
3.2.4.2.2.9	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.3	+28 Analog Telemetry Bus (ATB) Test	X		X	X
3.2.4.2.3.2	Instrument Feedback Test	Note 7			
3.2.4.2.3.3	Transient Susceptibility and Power Quality Tests	X			
3.2.4.2.4	+10 V Interface Bus Test	X		X	X
3.2.4.2.4.2	Instrument Feedback Test	Note 7			
3.2.4.3.2	Clock Signals Test	X			X
3.2.4.3.3	Commands and Digital-B Telemetry Test	X	X	X	X
3.2.4.3.4	Digital-A Data Output Test	X	Note 4	Note 4	X
3.2.4.3.5	Analog Telemetry Test	X	Note 5	Note 5	X
3.2.4.3.6	Test Point Test	X		X	X
3.2.4.3.7	GSE Mode Test	X Note 6			
3.2.4.4	Radiometer Functional Test	X	X	X	X
3.2.4.4.2	Channel Identification Test	X			

Notes:
1. 3.2.4.2.5 (Power input test for LPT).
2. At 28V only.
3. 3.2.4.2.2 except 3.2.4.2.2.5 through 3.2.4.2.2.7.
4. Only full scan.
5. STE only (3.2.4.3.5.2).
6. GSE mode test/verification is not required and is for engineering use only.
7. Instrument feedback test will be performed in EMI/RFI Chamber using EMI/RFI test procedure AE-26151/5.

TEST DATA SHEET 1 (SHEET 1 OF 9)
Grounding Test (Paragraph 3.2.4.1)

J1 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	+28V MLB	> 100k	0.L.	PASS
J1-2	+28V MLB	> 100k	0.L.	
J1-3	+28V MLB RTN	> 100k	0.L.	
J1-4	+28V MLB RTN	> 100k	0.L.	
J1-5	+28V PLB	> 100k	0.L.	
J1-6	+28V PLB	> 100k	0.L.	
J1-7	+28V PLB RTN	> 100k	0.L.	
J1-8	+28V PLB RTN	> 100k	0.L.	
J1-9	+28V TMB	> 100k	0.L.	
J1-10	28V TMB RTN	> 100k	0.L.	
J1-11	NO CONNECTION	> 100k	0.L.	
J1-12	NO CONNECTION	> 100k	0.L.	
J1-13	CHASSIS GROUND (E1)	< 1	0.19Ω	
J1-14	+28V MLB	> 100k	0.L.	
J1-15	+28V MLB	> 100k	0.L.	
J1-16	+28V MLB RTN	> 100k	0.L.	
J1-17	+28V MLB RTN	> 100k	0.L.	
J1-18	+28V PLB	> 100k	0.L.	
J1-19	+28V PLB	> 100k	0.L.	
J1-20	+28V PLB RTN	> 100k	0.L.	
J1-21	+28V PLB RTN	> 100k	0.L.	
J1-22	+28V TMB	> 100k	0.L.	
J1-23	28V TMB RTN	> 100k	0.L.	
J1-24	SAFETY HTR PWR	> 100k	0.L.	
J1-25	SAFETY HTR RTN	> 100k	0.L.	PASS

OL => 40 MΩ

TEST DATA SHEET 1 (Sheet 2 of 9)
Grounding Test (Paragraph 3.2.4.1)

J2 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-1	Chassis Ground (E2)	< 1	0.15Ω	PASS
J2-2	DATA CLOCK (C1)	> 100k	0.L.	
J2-3	Signal Return	> 100k	0.L.	
J2-4	No Connection	> 100k	0.L.	
J2-5	DIGITAL A DATA OUT	> 100k	0.L.	
J2-6	DATA ENABLE (A1)	> 100k	0.L.	
J2-7	8 SEC SYNC PULSE	> 100k	0.L.	
J2-8	No Connection	> 100k	0.L.	
J2-9	No Connection	> 100k	0.L.	PASS

0.L. => 40 MΩ

J3 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J3-1	1.248 MHz CLK	> 100k	0.L.	PASS
J3-2	1.248 MHz CLK RTN	> 100k	0.L.	PASS
J3-3	Chassis GND (E3)	< 1	0.12 Ω	PASS

0.L. => 40 MΩ

J5 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J5-1	Chassis Ground (E5)	< 1	0.19Ω	PASS
J5-2	MODULE PWR IND	> 100k	0.L.	
J5-3	COLD CAL POS MSB (OUT)	> 100k	0.L.	
J5-4	No Connection	> 100k	0.L.	
J5-5	COMP MTR IND	> 100k	0.L.	
J5-6	ANT IN COLD CAL POS	> 100k	0.L.	
J5-7	No Connection	> 100k	0.L.	
J5-8	No Connection	> 100k	0.L.	
J5-9	SURV HTR ON/OFF	> 100k	0.L.	
J5-10	No Connection	> 100k	0.L.	
J5-11	COLD CAL POS LSB (OUT)	> 100k	0.L.	
J5-12	SCANNER ON PWR IND	> 100k	0.L.	
J5-13	ANT IN WARM CAL POS	> 100k	0.L.	
J5-14	ANT AT NADIR POS	> 100k	0.L.	
J5-15	FULL SCAN MODE	> 100k	0.L.	PASS

0.L. => 40 MΩ

TEST DATA SHEET 1 (Sheet 3 of 9)
Grounding Test (Paragraph 3.2.4.1)

J4 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J4-1	Chassis Ground (E4)	< 1	0.15Ω	PASS
J4-2	MODULE PWR DISCONN	> 100k	O.L.	
J4-3	SURVIVAL HTR ON	> 100k	O.L.	
J4-4	MODULE TOTALLY OFF	> 100k	O.L.	
J4-5	COMP MTR ON/OFF	> 100k	O.L.	
J4-6	ANT AT COLD CAL POS	> 100k	O.L.	
J4-7	No Connection	> 100k	O.L.	
J4-8	ANT AT NADIR POS	> 100k	O.L.	
J4-9	COLD CAL POS MSB (IN)	> 100k	O.L.	
J4-10	No Connection	> 100k	O.L.	
J4-11	No Connection	> 100k	O.L.	
J4-12	+10V INTERFACE BUS	> 100k	O.L.	
J4-13	10V INTERFACE BUS RTN	> 100k	O.L.	
J4-14	MODULE PWR CONN	> 100k	O.L.	
J4-15	SURVIVAL HTR OFF	> 100k	O.L.	
J4-16	SCANNER PWR ON/OFF	> 100k	O.L.	
J4-17	ANT AT WARM CAL POS	> 100k	O.L.	
J4-18	FULL SCAN	> 100k	O.L.	
J4-19	COLD CAL POS LSB (IN)	> 100k	O.L.	
J4-20	No Connection	> 100k	O.L.	
J4-21	No Connection	> 100k	O.L.	
J4-22	No Connection	> 100k	O.L.	
J4-23	No Connection	> 100k	O.L.	
J4-24	+10V INTERFACE BUS	> 100k	O.L.	
J4-25	10V INTERFACE BUS RTN	> 100k	O.L.	PASS

O.L. => 40 MΩ

TEST DATA SHEET 1 (Sheet 4 of 9)
Grounding Test (Paragraph 3.2.4.1)

J6 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-1	Chassis GND (E6)	< 1	0.16Ω	PASS
J6-2	RF SHELF TEMP	> 100k	O.L.	
J6-3	COMP. MTR. TEMP	> 100k	O.L.	
J6-4	WARM LOAD TEMP	> 100k	O.L.	
J6-5	No Connection	> 100k	O.L.	
J6-6	No Connection	> 100k	O.L.	
J6-7	No Connection	> 100k	O.L.	
J6-8	SCAN MTR CURR	> 100k	O.L.	
J6-9	+15V ANT DR MON	> 100k	O.L.	
J6-10	+15V ANT DR MON	> 100k	O.L.	
J6-11	+15V SIG PROC MON	> 100k	O.L.	
J6-12	+15V SIG PROC MON	> 100k	O.L.	
J6-13	L.O. #1 MON	> 100k	O.L.	
J6-14	No Connection	> 100k	O.L.	
J6-15	No Connection	> 100k	O.L.	
J6-16	No Connection	> 100k	O.L.	
J6-17	No Connection	> 100k	O.L.	
J6-18	No Connection	> 100k	O.L.	
J6-19	No Connection	> 100k	O.L.	
J6-20	28V TMB RTN	> 100k	O.L.	
J6-21	No Connection	> 100k	O.L.	
J6-22	SCAN MTR TEMP	> 100k	O.L.	
J6-23	No Connection	> 100k	O.L.	
J6-24	No Connection	> 100k	O.L.	
J6-25	No Connection	> 100k	O.L.	
J6-26	No Connection	> 100k	O.L.	
J6-27	COMP MTR CURR	> 100k	O.L.	
J6-28	-15V ANT DR MON	> 100k	O.L.	
J6-29	-15V SIG PROC MON	> 100k	O.L.	
J6-30	L.O. #2 MON	> 100k	O.L.	
J6-31	No Connection	> 100k	O.L.	
J6-32	No Connection	> 100k	O.L.	
J6-33	No Connection	> 100k	O.L.	
J6-34	MIXER/AMP MON	> 100k	O.L.	
J6-35	No Connection	> 100k	O.L.	
J6-36	No Connection	> 100k	O.L.	
J6-37	No Connection	> 100k	O.L.	PASS

O.L. => 40 MΩ

TEST DATA SHEET 1 (Sheet 5 of 9)
Grounding Test (Paragraph 3.2.4.1)

J7 of Spacecraft Interface				
From Chassis Ground to	Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J7-1	Chassis GND (E7)	< 1	0.21Ω	PASS
J7-2	No Connection	> 100k	O.L.	
J7-3	No Connection	> 100k	O.L.	
J7-4	No Connection	> 100k	O.L.	
J7-5	15V RTN (2/3)	> 100k	O.L.	
J7-6	DUMP TP	> 100k	O.L.	
J7-7	No Connection	> 100k	O.L.	
J7-8	CH1 ANALOG OUT TP	> 100k	O.L.	
J7-9	CH2 ANALOG OUT TP	> 100k	O.L.	
J7-10	No Connection	> 100k	O.L.	
J7-11	No Connection	> 100k	O.L.	
J7-12	No Connection	> 100k	O.L.	
J7-13	No Connection	> 100k	O.L.	
J7-14	No Connection	> 100k	O.L.	
J7-15	No Connection	> 100k	O.L.	
J7-16	No Connection	> 100k	O.L.	
J7-17	GSE CMD LSB	> 100k	O.L.	
J7-18	GSE CMD MSB-1	> 100k	O.L.	
J7-19	+5VDC GSE INTERLOCK A	> 100k	O.L.	
J7-20	No Connection	> 100k	O.L.	
J7-21	No Connection	> 100k	O.L.	
J7-22	No Connection	> 100k	O.L.	
J7-23	I/H TP	> 100k	O.L.	
J7-24	No Connection	> 100k	O.L.	
J7-25	No Connection	> 100k	O.L.	
J7-26	15V RTN (2/3)	> 100k	O.L.	
J7-27	No Connection	> 100k	O.L.	
J7-28	No Connection	> 100k	O.L.	
J7-29	No Connection	> 100k	O.L.	
J7-30	No Connection	> 100k	O.L.	
J7-31	No Connection	> 100k	O.L.	
J7-32	No Connection	> 100k	O.L.	
J7-33	No Connection	> 100k	O.L.	
J7-34	No Connection	> 100k	O.L.	
J7-35	GSE CMD MSB	> 100k	O.L.	
J7-36	5V RTN (1)	> 100k	O.L.	
J7-37	+5VDC GSE INTERLOCK B	> 100k	O.L.	PASS

O.L. => 40 MΩ

TEST DATA SHEET 1 (Sheet 6 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-1	J1-2	+28V MLB	< 1	0.23 Ω	PASS
J1-1	J1-14	+28V MLB	< 1	0.29 Ω	
J1-1	J1-15	+28V MLB	< 1	0.36 Ω	
J1-3	J1-4	28V MLB RTN	< 1	0.22 Ω	
J1-3	J1-16	28V MLB RTN	< 1	0.23 Ω	
J1-3	J1-17	28V MLB RTN	< 1	0.27 Ω	
J1-5	J1-6	+28V PLB	< 1	0.23 Ω	
J1-5	J1-18	+28V PLB	< 1	0.27 Ω	
J1-5	J1-19	+28V PLB	< 1	0.25 Ω	
J1-7	J1-8	28V PLB RTN	< 1	0.23 Ω	
J1-7	J1-20	28V PLB RTN	< 1	0.24 Ω	
J1-7	J1-21	28V PLB RTN	< 1	0.30 Ω	
J1-9	J1-22	+28V TMB	< 1	0.21 Ω	
J1-10	J1-23	28V TMB RTN	< 1	0.20 Ω	
J1-10	J6-20	28V TMB RTN	< 1	0.43 Ω	
J4-12	J4-24	+10V INTERFACE BUS	< 1	0.36 Ω	
J4-13	J4-25	10V INTERFACE BUS RTN	< 1	0.29 Ω	
J1-1	J1-3	+28V MLB	> 100k	O.L.	
J1-1	J1-5	+28V MLB	> 100k	O.L.	
J1-1	J1-7	+28V MLB	> 100k	O.L.	
J1-1	J1-9	+28V MLB	> 100k	O.L.	
J1-1	J1-10	+28V MLB	> 100k	O.L.	
J1-1	J1-24	+28V MLB	> 100k	O.L.	
J1-1	J1-25	+28V MLB	> 100k	O.L.	
J1-1	J2-3	+28V MLB	> 100k	O.L.	
J1-1	J4-12	+28V MLB	> 100k	O.L.	
J1-1	J4-13	+28V MLB	> 100k	O.L.	
J1-3	J1-5	28V MLB RTN	> 100k	12.7 MΩ	
J1-3	J1-7	28V MLB RTN	> 100k	399.3 KΩ	
J1-3	J1-9	28V MLB RTN	> 100k	O.L.	
J1-3	J1-10	28V MLB RTN	> 100k	O.L.	
J1-3	J1-24	28V MLB RTN	> 100k	O.L.	
J1-3	J1-25	28V MLB RTN	> 100k	O.L.	
J1-3	J2-3	28V MLB RTN	> 100k	201 KΩ	
J1-3	J4-12	28V MLB RTN	> 100k	7.7 MΩ	
J1-3	J4-13	28V MLB RTN	> 100k	2.8 MΩ	PASS

O.L. => 40 MΩ

TEST DATA SHEET 1 (Sheet 7 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J1-5	J1-7	+28V PLB	> 100k	O.L.	PASS
J1-5	J1-9	+28V PLB	> 100k	O.L.	
J1-5	J1-10	+28V PLB	> 100k	O.L.	
J1-5	J1-24	+28V PLB	> 100k	O.L.	
J1-5	J1-25	+28V PLB	> 100k	O.L.	
J1-5	J2-3	+28V PLB	> 100k	O.L.	
J1-5	J4-12	+28V PLB	> 100k	O.L.	
J1-5	J4-13	+28V PLB	> 100k	O.L.	
J1-7	J1-9	28V PLB RTN	> 100k	O.L.	
J1-7	J1-10	28V PLB RTN	> 100k	O.L.	
J1-7	J1-24	28V PLB RTN	> 100k	O.L.	
J1-7	J1-25	28V PLB RTN	> 100k	O.L.	
J1-7	J2-3	28V PLB RTN	> 100k	170KΩ	
J1-7	J4-12	28V PLB RTN	> 100k	4.5MΩ	
J1-7	J4-13	28V PLB RTN	> 100k	2.8MΩ	
J1-9	J1-10	+28V TMB	> 100k	8.2MΩ	
J1-9	J1-24	+28V TMB	> 100k	O.L.	
J1-9	J1-25	+28V TMB	> 100k	O.L.	
J1-9	J2-3	+28V TMB	> 100k	O.L.	
J1-9	J4-12	+28V TMB	> 100k	O.L.	
J1-9	J4-13	+28V TMB	> 100k	O.L.	
J1-10	J1-24	28V TMB RTN	> 100k	O.L.	
J1-10	J1-25	28V TMB RTN	> 100k	O.L.	
J1-10	J2-3	28V TMB RTN	> 100k	O.L.	
J1-10	J4-12	28V TMB RTN	> 100k	O.L.	
J1-10	J4-13	28V TMB RTN	> 100k	O.L.	
J1-24	J1-25	SAFETY HTR PWR	> 100k	O.L.	
J1-24	J2-3	SAFETY HTR PWR	> 100k	O.L.	
J1-24	J4-12	SAFETY HTR PWR	> 100k	O.L.	
J1-24	J4-13	SAFETY HTR PWR	> 100k	O.L.	
J1-25	J2-3	SAFETY HTR PWR RTN	> 100k	O.L.	
J1-25	J4-12	SAFETY HTR PWR RTN	> 100k	O.L.	
J1-25	J4-13	SAFETY HTR PWR RTN	> 100k	O.L.	
J2-3	J4-12	SIGNAL RTN	> 100k	3.8MΩ	
J2-3	J4-13	SIGNAL RTN	> 100k	2.6MΩ	
J4-12	J4-13	+10V INTERFACE BUS	> 100k	5.0MΩ	PASS

O.L. => 40MΩ

TEST DATA SHEET 1 (Sheet 8 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J2-2	J4-13	DATA CLOCK (C1)	> 2k	239 KΩ	PASS
J2-5	J4-13	DIGITAL A DATA OUT	> 2k	3.7 MΩ	
J2-6	J4-13	DATA ENABLE (A1)	> 2k	755 KΩ	
J2-7	J4-13	8 SEC SYNC PULSE	> 2k	760 KΩ	
J3-1	J4-13	1.248 MHZ CLK	> 2k	728 KΩ	
J3-2	J4-13	1.248 MHZ CLK RTN	> 2k	O.L.	
J4-2	J4-13	MODULE PWR DISCONN	> 2k	240 KΩ	
J4-3	J4-13	SURVIVAL HTR ON	> 2k	767 KΩ	
J4-4	J4-13	MODULE TOTALLY OFF	> 2k	763 KΩ	
J4-5	J4-13	COMP MTR ON/OFF	> 2k	760 KΩ	
J4-6	J4-13	ANT AT COLD CAL POS	> 2k	755 KΩ	
J4-8	J4-13	ANT AT NADIR POS	> 2k	751 KΩ	
J4-9	J4-13	COLD CAL POS MSB (IN)	> 2k	753 KΩ	
J4-14	J4-13	MODULE PWR CONN	> 2k	755 KΩ	
J4-15	J4-13	SURVIVAL HTR OFF	> 2k	760 KΩ	
J4-16	J4-13	SCANNER PWR ON/OFF	> 2k	760 KΩ	
J4-17	J4-13	ANT AT WARM CAL POS	> 2k	740 KΩ	
J4-18	J4-13	FULL SCAN	> 2k	760 KΩ	
J4-19	J4-13	COLD CAL POS LSB (IN)	> 2k	758 KΩ	
J5-2	J4-13	MODULE PWR IND	> 2k	3.7 MΩ	
J5-3	J4-13	COLD CAL POS MSB	> 2k	3.7 MΩ	
J5-5	J4-13	COMP MTR IND	> 2k	3.7 MΩ	
J5-6	J4-13	ANT IN COLD CAL POS	> 2k	3.8 MΩ	
J5-9	J4-13	SURV HTR ON/OFF	> 2k	3.8 MΩ	
J5-11	J4-13	COLD CAL POS LSB	> 2k	3.7 MΩ	
J5-12	J4-13	SCANNER ON PWR IND	> 2k	3.7 MΩ	
J5-13	J4-13	ANT IN WARM CAL POS	> 2k	3.8 MΩ	
J5-14	J4-13	ANT IN NADIR POS	> 2k	3.8 MΩ	
J5-15	J4-13	FULL SCAN MODE	> 2k	3.8 MΩ	PASS

O.L. = 740 MΩ

TEST DATA SHEET 1 (Sheet 9 of 9)
Grounding Test (Paragraph 3.2.4.1)

Source Pin	Destination Pin	Source Pin Description	Required Resistance (Ohms)	Measured Value (Ohms)	Pass/Fail
J6-8	J4-13	SCAN MTR CURR	> 2k	3.1 MΩ	PASS
J6-9	J4-13	+15V ANT DR MON	> 2k	1.8 MΩ	
J6-10	J4-13	+5V ANT DR MON	> 2k	1.8 MΩ	
J6-11	J4-13	+15V SIG PROC MON	> 2k	1.6 MΩ	
J6-12	J4-13	+5V SIG PROC MON	> 2k	1.6 MΩ	
J6-13	J4-13	L.O. #1 MON	> 2k	1.6 MΩ	
J6-20	J4-13	28V TMB RTN	> 2k	O.L.	
J6-22	J4-13	SCAN MTR TEMP	> 2k	O.L.	
J6-27	J4-13	COMP MTR CURR	> 2k	2.9 MΩ	
J6-28	J4-13	-15V ANT DR MON	> 2k	1.8 MΩ	
J6-29	J4-13	-15V SIG PROC MON	> 2k	1.6 MΩ	
J6-30	J4-13	L.O. #2 MON	> 2k	1.6 MΩ	
J6-34	J4-13	MIXER/AMP MON	> 2k	1.6 MΩ	
J6-2	J1-10	RF SHELF TEMP	> 2k	14.7 KΩ	
J6-3	J1-10	COMP MTR.TEMP	> 2k	14.7 KΩ	
J6-4	J1-10	WARM LOAD TEMP	> 2k	14.7 KΩ	PASS

O.L. => 40 MΩ

Op. 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________ LPT ________

[signature] AMSU 5 SEIT 2/18/00
Test Systems Engineer Date

[signature] 2/19/00
Customer Representative Date

[signature] 2/19/00
Quality Control

TEST DATA SHEET 2
+28 MLB Turn-on Transient (Paragraph 3.2.4.2.1.1)

At 28.56 Vdc:

Step	Parameter	Measured/ Calculated	Required *	Required **	Pass/ Fail
7	Peak Current	4.85 Amps	<8.3 Amps	<5.7 Amps	Pass
7	Pulse Width	60.9 ms	<100 ms	<120 ms	Pass
7	Rate of Change (Slope): dI/dT	192.7 mA/µs	<640 mA/µs	<250 mA/µs	Pass

At 27.44 Vdc:

Step	Parameter	Measured/ Calculated	Required *	Required **	Pass/ Fail
7	Peak Current	4.538 Amps	<8.3 Amps	<5.7 Amps	Pass
7	Pulse Width	62.3 ms	<100 ms	<120 ms	Pass
7	Rate of Change (Slope): dI/dT	201.6 mA/µs	<640 mA/µs	<250 mA/µs	Pass

At 28.00 Vdc:

Step	Parameter	Measured/ Calculated	Required *	Required **	Pass/ Fail
7	Peak Current	4.6 Amps	<8.3 Amps	<5.7 Amps	Pass
7	Pulse Width	62.2 ms	<100 ms	<120 ms	Pass
7	Rate of Change (Slope): dI/dT	170.1 mA/µs	<640 mA/µs	<250 mA/µs	Pass

* For S/N 101 through 104
** For S/N 105 through 109.

OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 336079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

Joseph Englund
Customer Representative Date
Date
(Flight Hardware Only)

Ray Berkbigler 2-19-00
Test Systems Engineer Date

Quality Control 269 19FEB00

TEST DATA SHEET 3
+28 MLB Operating Power (Paragraph 3.2.4.2.1.2)

Step	+28V MLB at 27 Volts	Measured	Units	Required	Pass/Fail
4	+28V MLB voltage at 27V (V_b) (Measured)	27.03V	Volts	27.0 ± 0.1	PASS
5	Average Current (I_V)	.65 A	Amps	N/A	N/A
6	+28V MLB bus power = I_V x V_b	17.57W	Watts	25W max	PASS
	+28V MLB at 28 Volts				
7	+28V MLB Bus Voltage at 28V (V_b) (Measured)	28.02V	Volts	28.0 ± 0.1	PASS
8	Average Current (I_V)	.63 A	Amps	N/A	N/A
9	+28V MLB Operating Power = I_V X V_b	17.65W	Watts	25W max	PASS
	+28V MLB at 29 Volts				
10	+28V MLB voltage at 29V (V_b) (Measured)	29.03V	Volts	29.0 ± 0.1	PASS
11	Average Current (I_V)	.62 A	Amps	N/A	N/A
12	+28V MLB operating power = I_V x V_b	17.99W	Watts	25W max	PASS

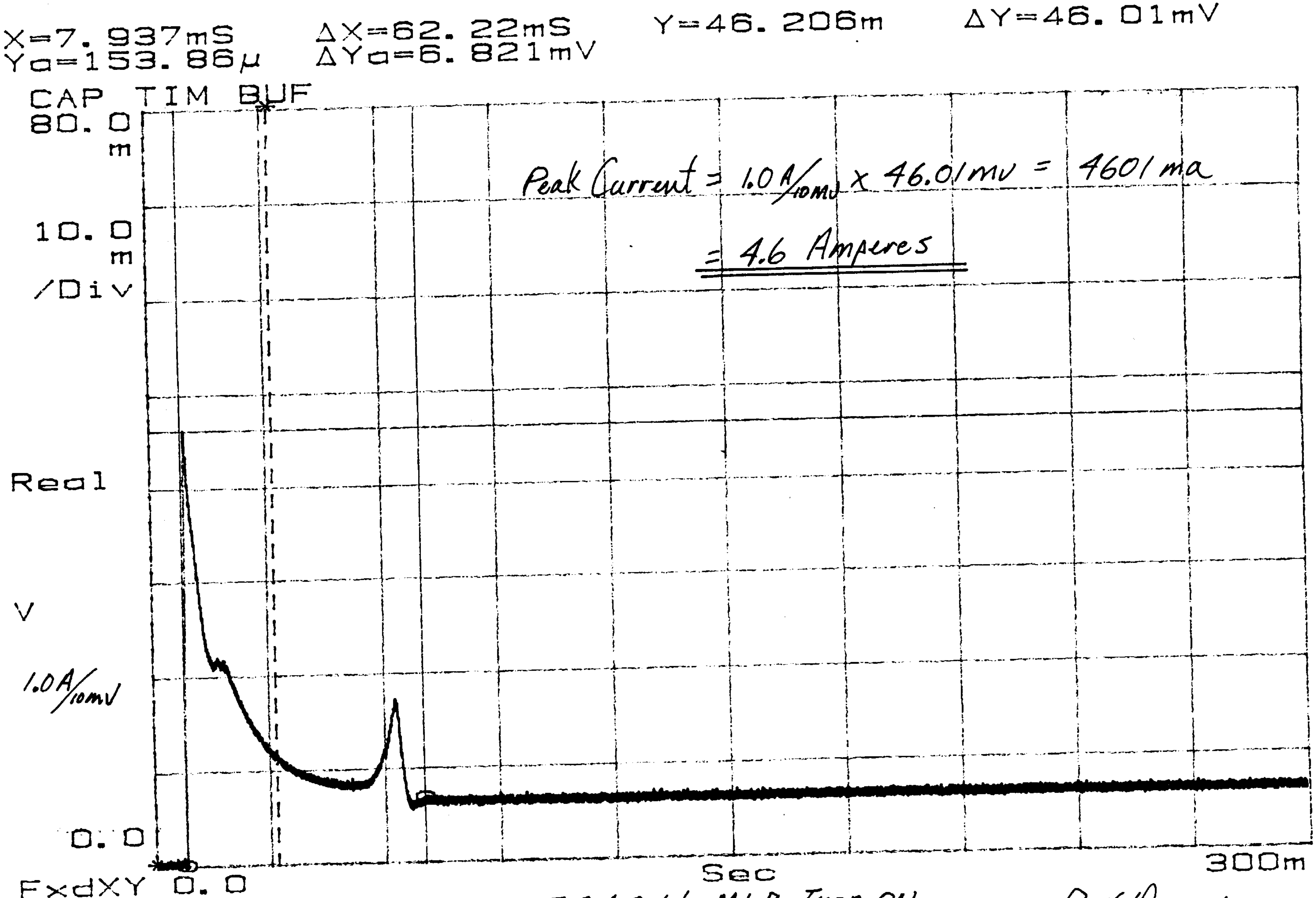
Op. 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT (Final CPT) Sub CPT ________

Ken Shane 2-18-00
Test Systems Engineer Date

[signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

Anita Navarro 2/19/00
Quality Control



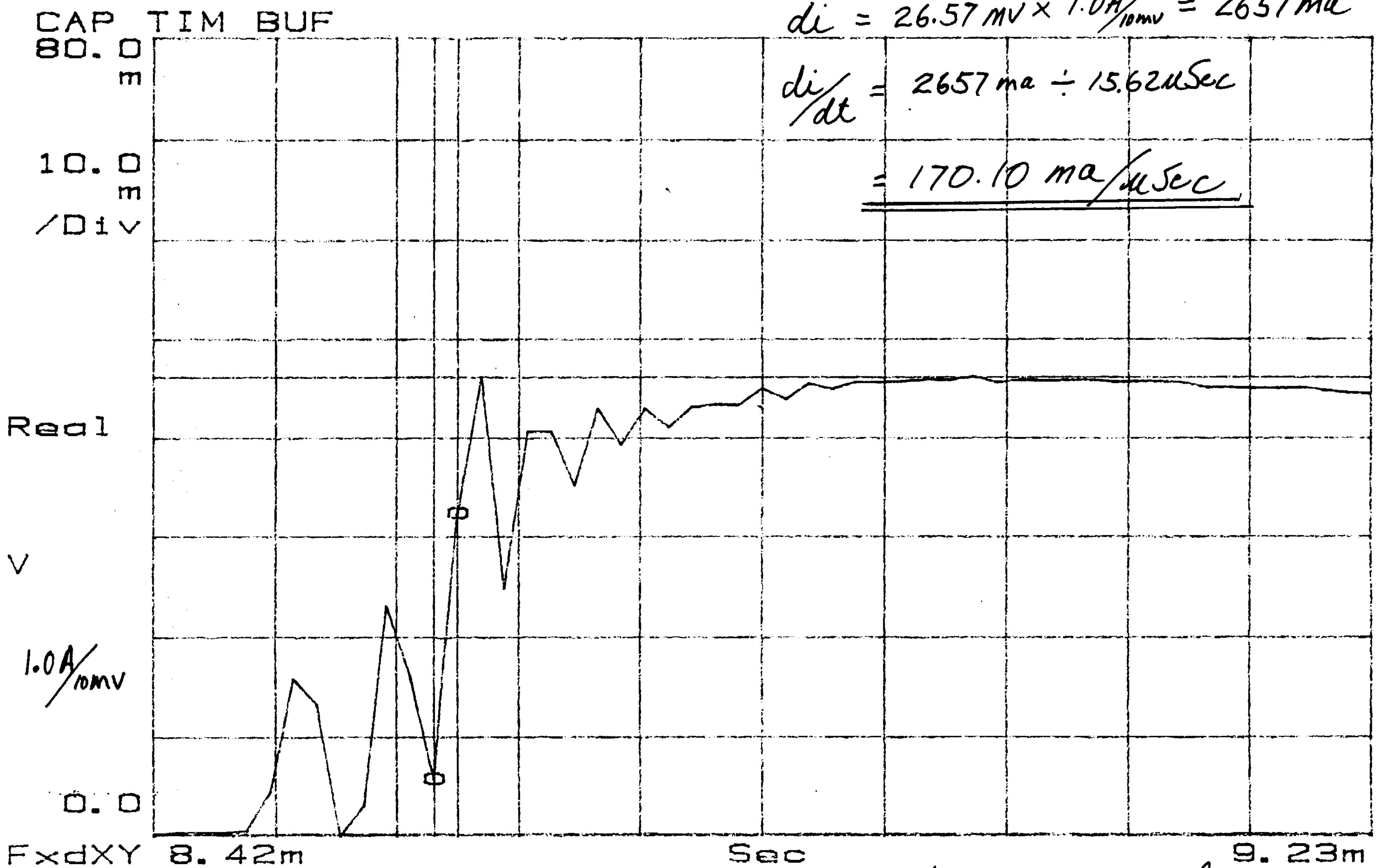
3.24.2.1.1 MLB Turn-ON
+28V

S/O: 335079 OP: 0730 TDS-42 TEST ENG: [signature] Date: 2-19-00

P/N: 1331200-2-TST SN: 108 FINAL CPT Quality: [signature]

X=8.609mS ΔX=15.62µS Y=46.206m ΔY=46.01mV
Ya=5.7954m ΔYa=26.57mV

$di = 26.57\,mV \times 1.0A/10mv = 2657\,ma$



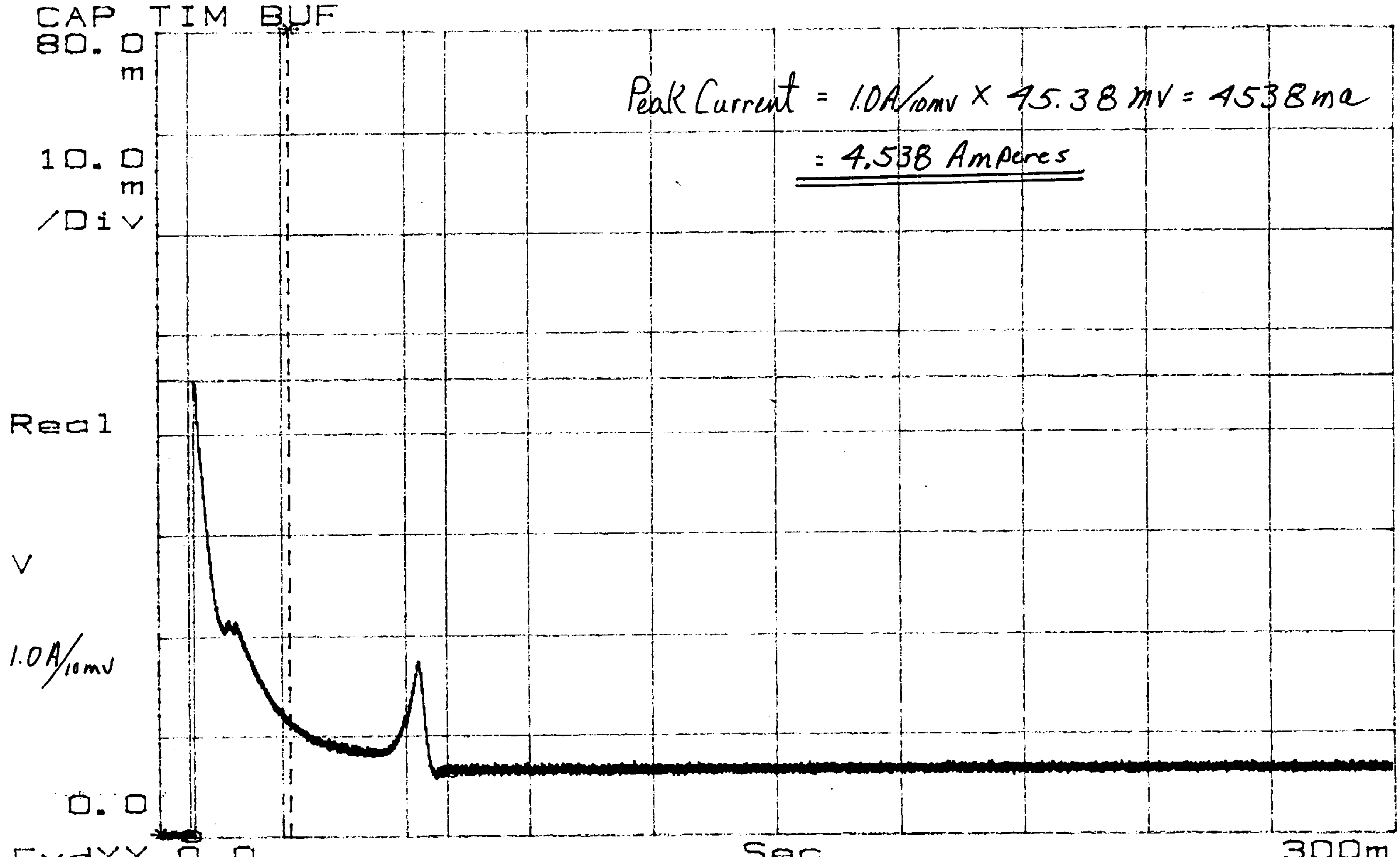
$di/dt = 2657\,ma \div 15.62\,uSec$

$= 170.10\,ma/uSec$

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

32.4.2.1.1 MLB Turn-ON
di/dt +28V TEST ENG: [signature] Date: 2-19-00
FINAL CPT TDS 42 Quality: [signature]

X=7.547mS ΔX=62.3mS Y=0.0 ΔY=45.38mV
Ya=102.573μ ΔYa=6.206mV

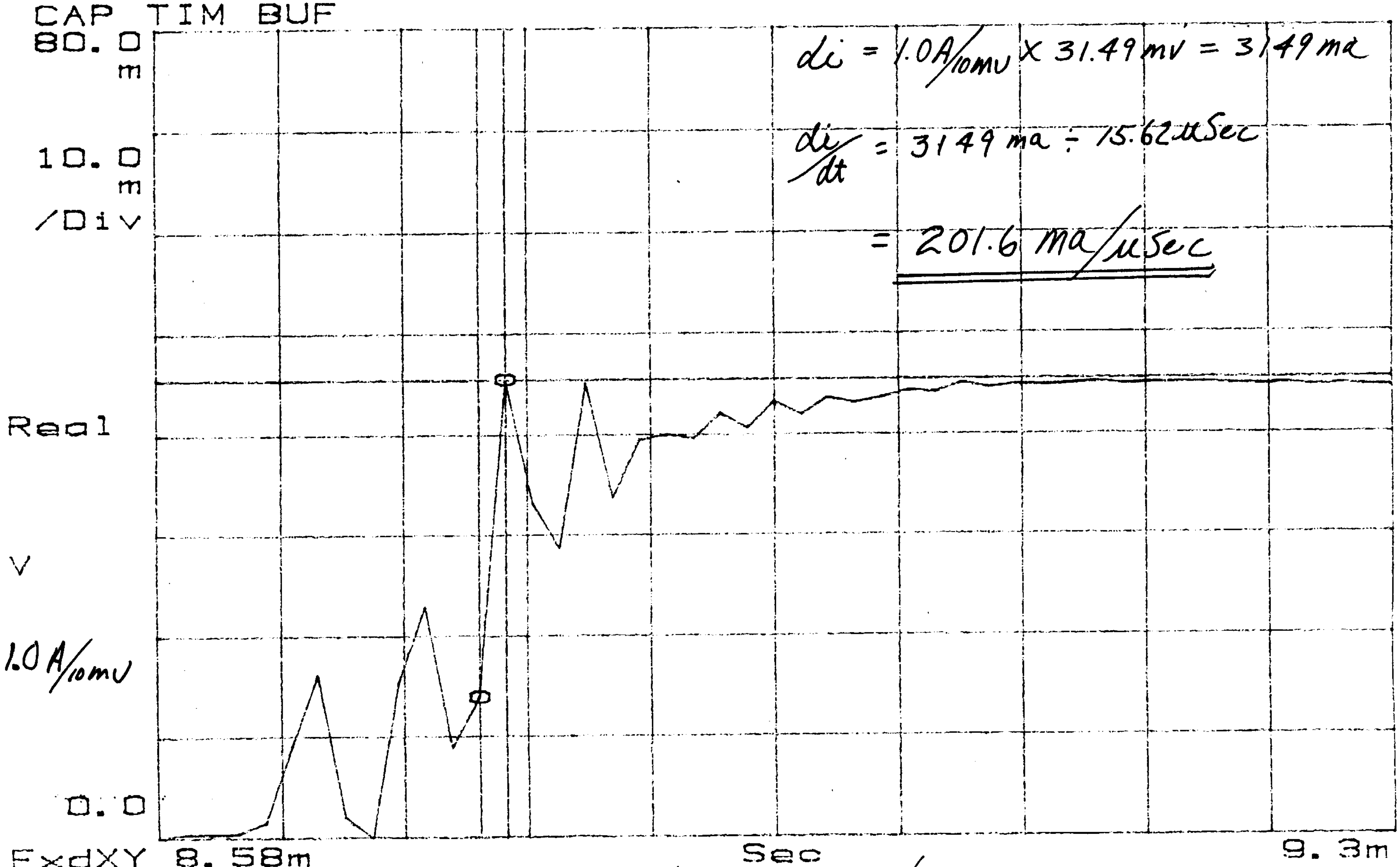


3.24.2.1.1 MLB Turn-ON
+27.44V TEST ENG: [signature] Date: 2-19-00

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TDS-42 Quality: [signature] (A 269)

X=8.766mS ΔX=15.62μS Y=0.0 ΔY=45.38mV
Ya=13.8987m ΔYa=31.49mV

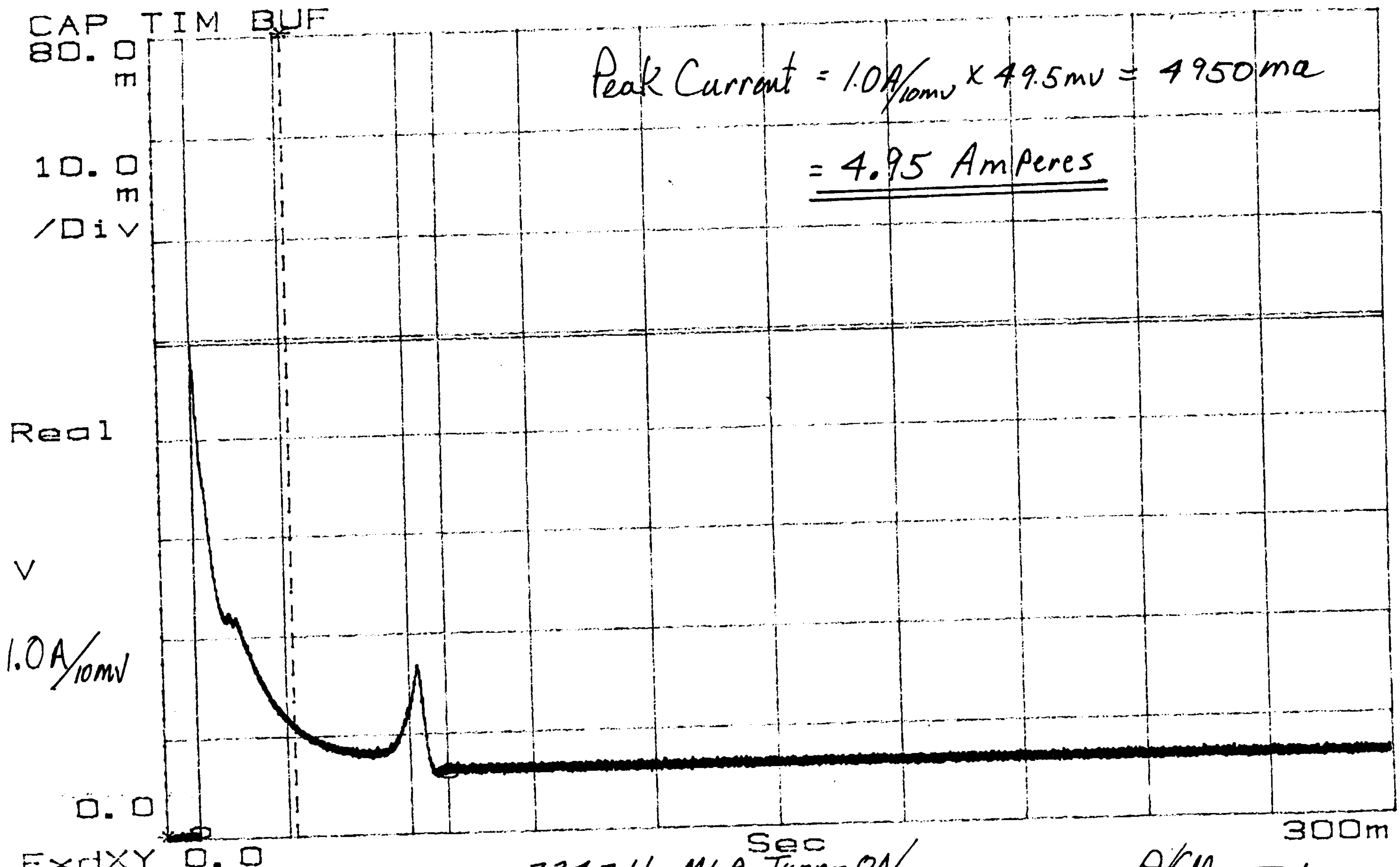


3.2.4.2.1.1 MLB Turn-ON di/dt +27.44V

S/O: 335079 OP: 0730 TEST ENG: [signature] Date: 2-19-00

P/N: 1331200-2-TST SN: 108 FINAL CPT TDS-42 2-2000 Quality: [signature] (A 260)

X=69. 06mS ΔX=60. 92mS Y=0. 0 ΔY=49. 5mV
Ya=6. 00055m ΔYa=5. 334mV



3.2.4.2.1.1 MLB Turn-ON
+28.56 V

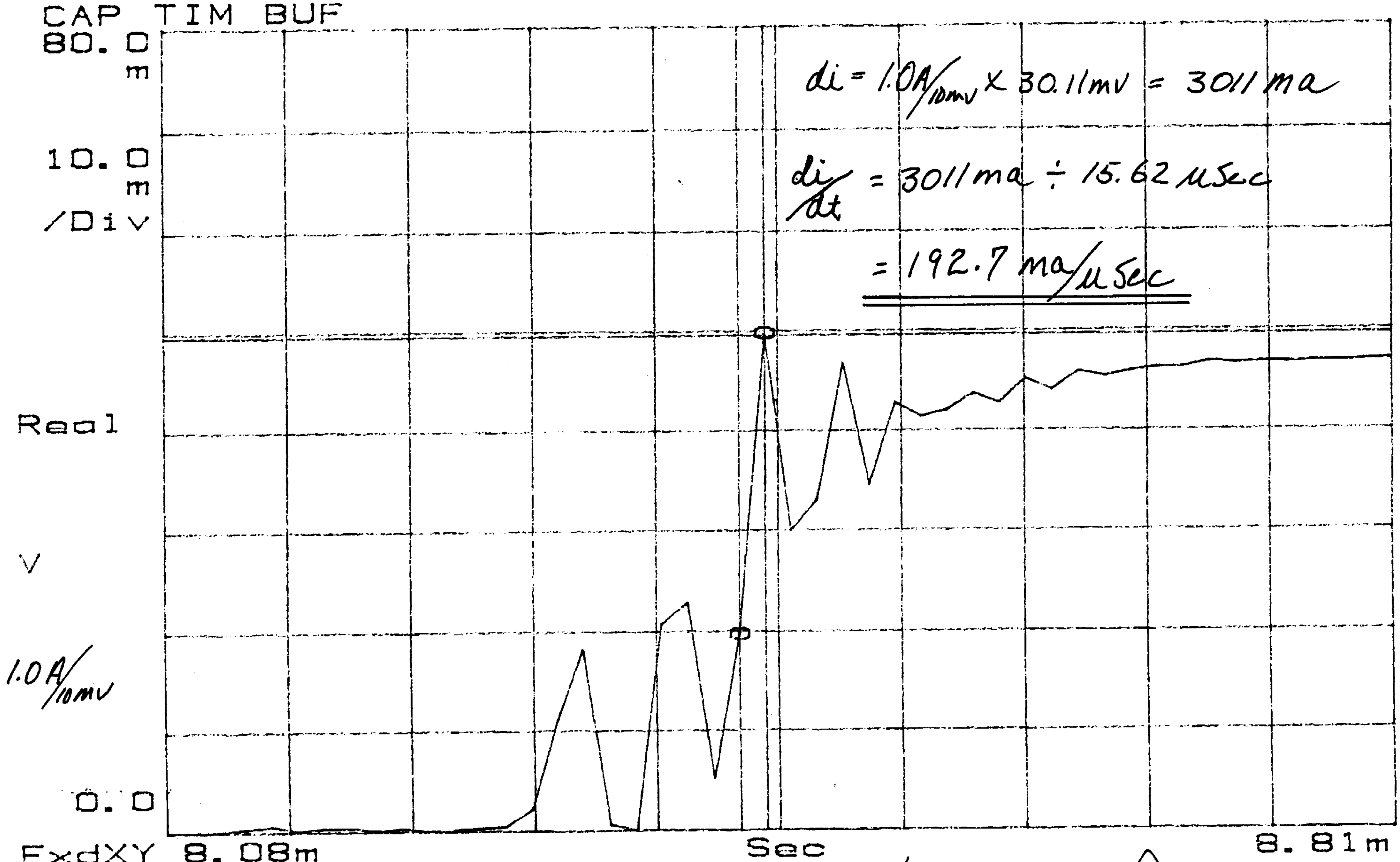
S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TDS-12

TEST ENG: [signature] Date: 2-19-00

Quality: [signature]

X=8.437mS ΔX=15.62μS Y=0.0 ΔY=49.5mV
Ya=49.6968m ΔYa=30.11mV



32.4.2.1.1 MLB Turn-ON
di/dt +28.56V

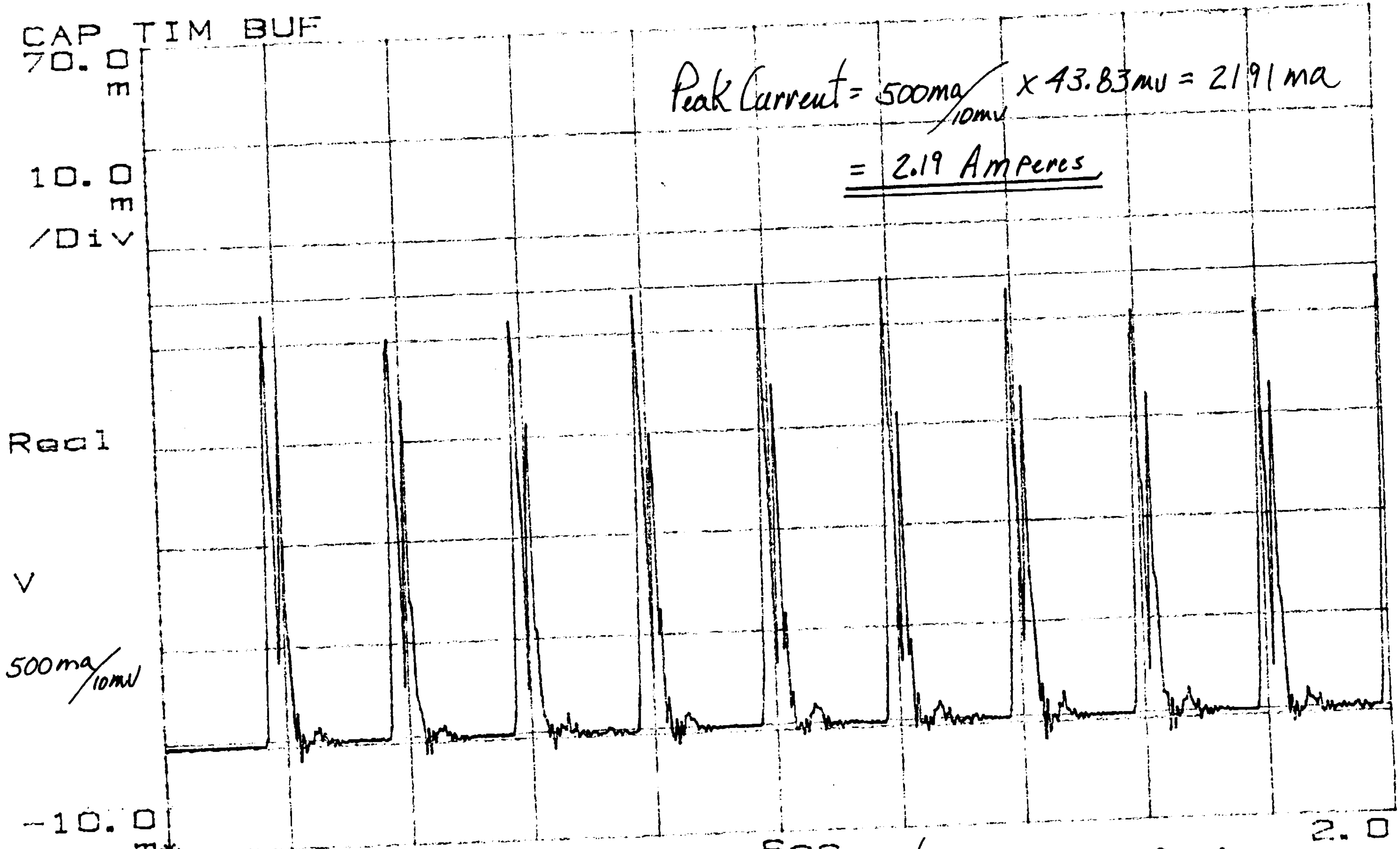
S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TDS-42

TEST ENG: [signature] Date: 2-19-00
Quality: [signature]

7A 269

Y=618.18μ   ΔY=43.83mV

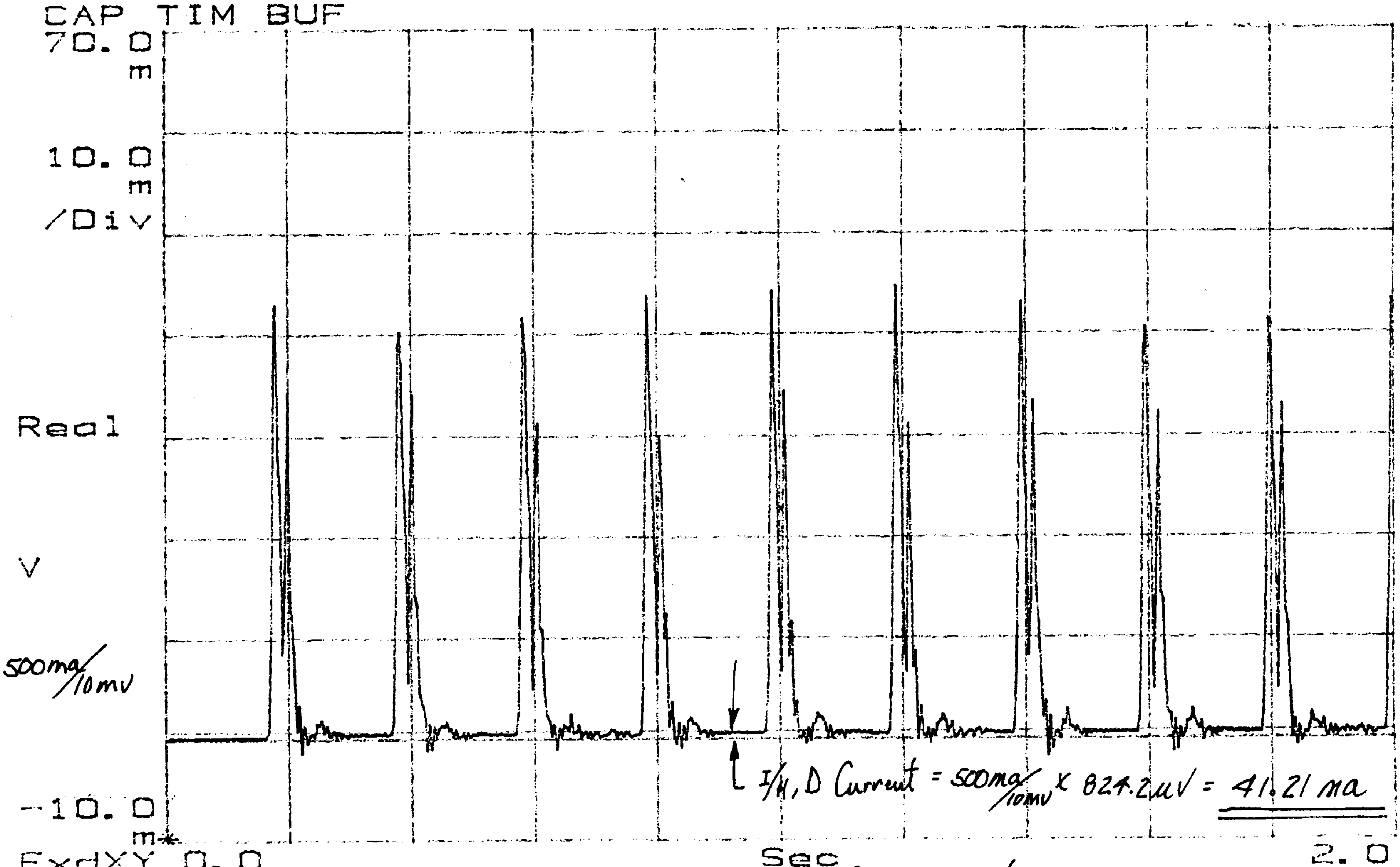


3.2.4.2.2.1   0→2 Sec PLB Current
Peak Current

TEST ENG: [signature] Date: 2-19-00

S/0: 335079   OP: 0730   TDS 4   Quality: [signature] 2-20-00

Y=-109.09μ ΔY=824.2μV



3.2.4.22.1 0-2 Sec PLB Current

I/H, D Current

FINAL CPT TDS-4

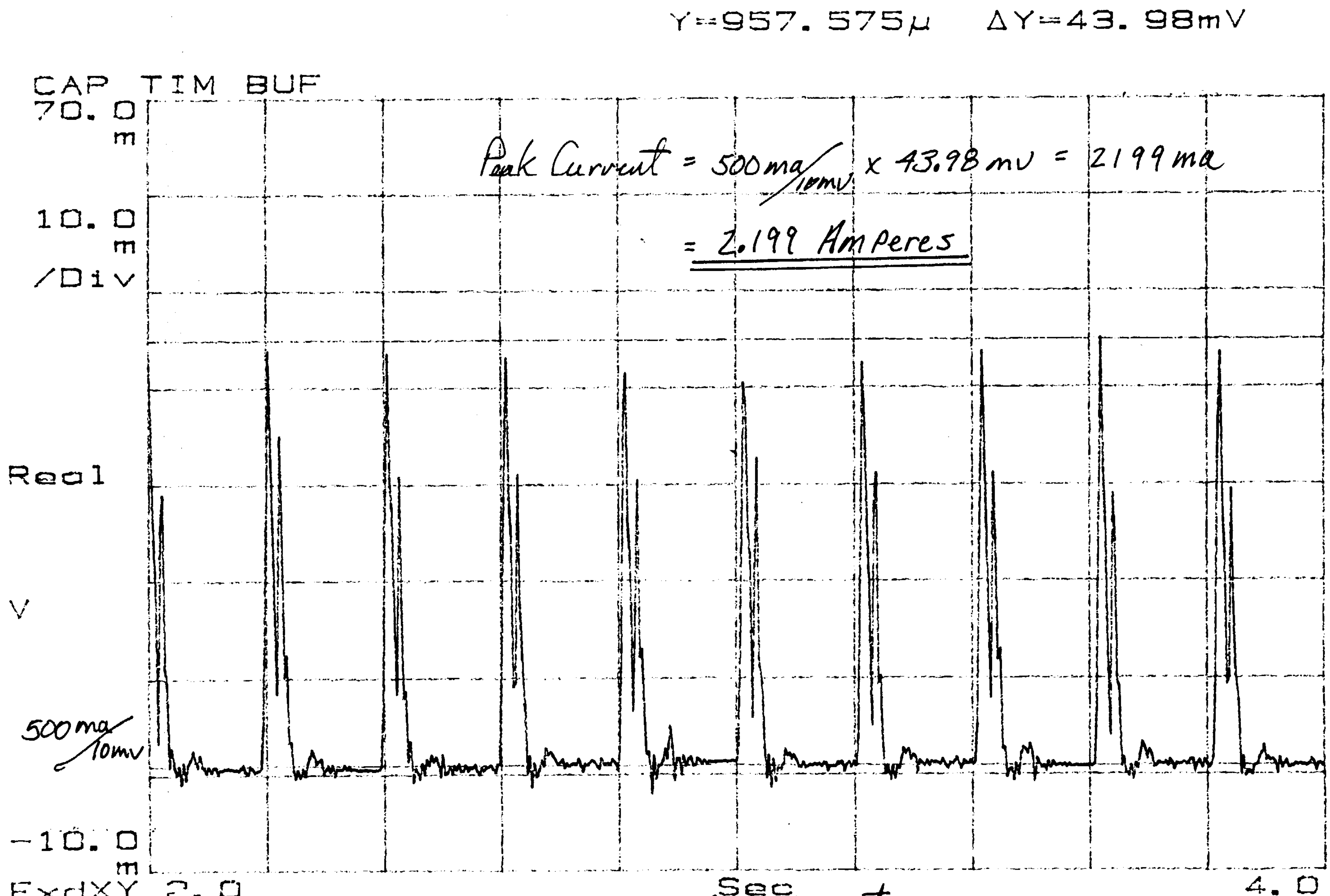
S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

TEST ENG: [signature] Date: 2-19-00

Quality: [signature] 2-20-00

7A 194



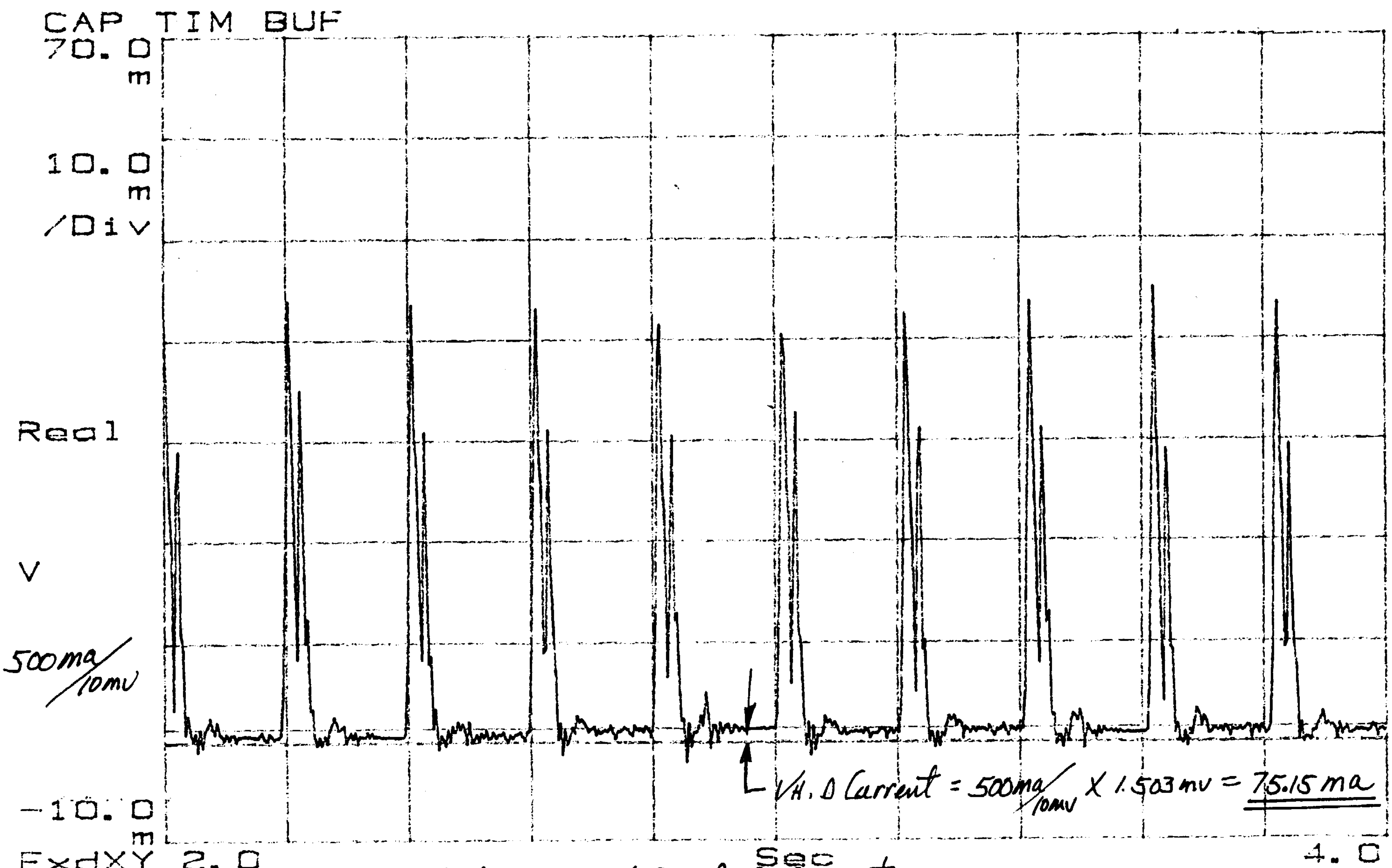
3.24.2.2.2 2-4 Sec PLB Current
Peak Current

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TDS-4

TEST ENG: [signature] Date: 2-19-00
Quality: [signature] 2-20-00

Y=-109.09μ   ΔY=1.503mV



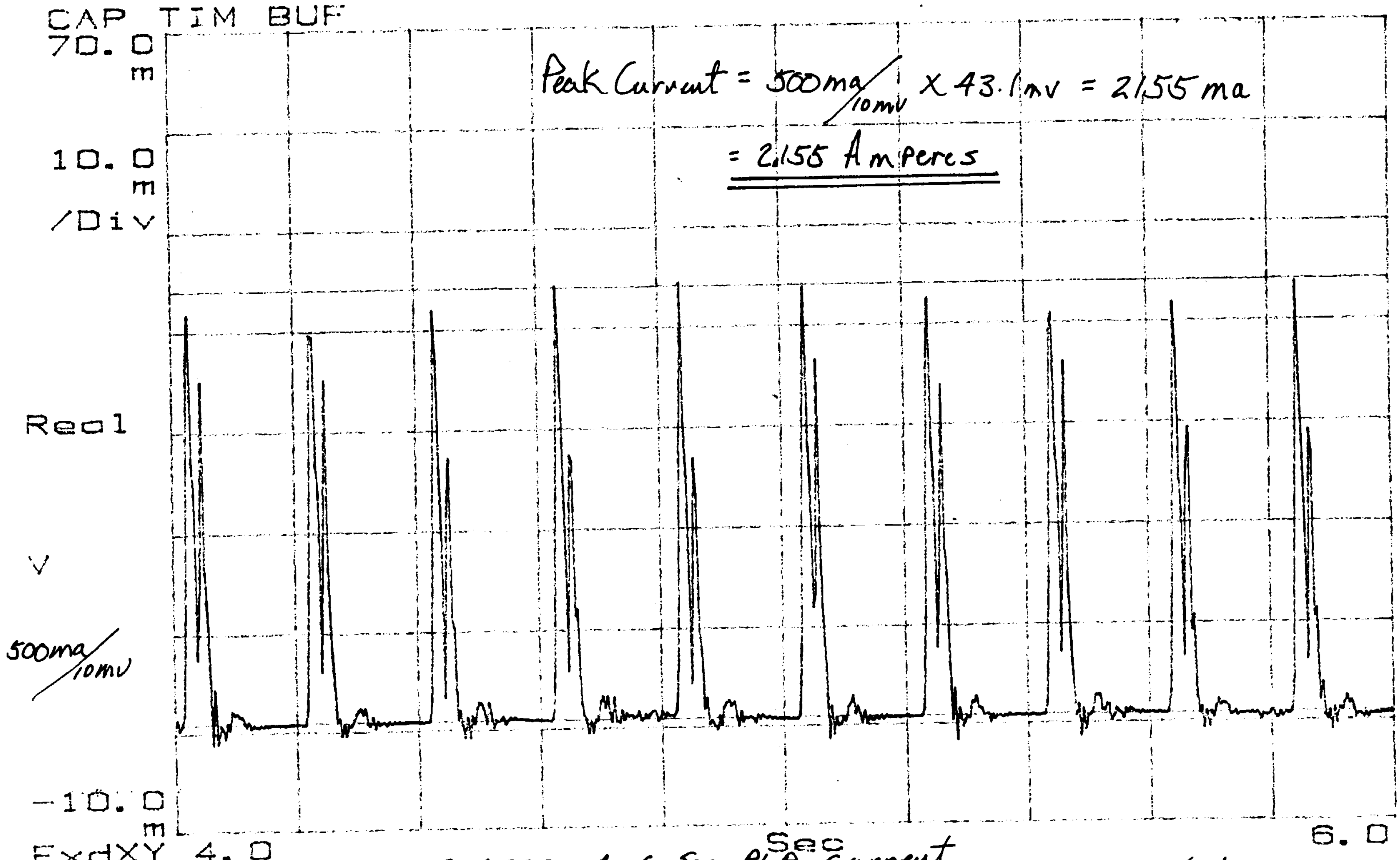
324.222   2-4 Sec PLB Current
VH.D Current

S/O: 335079   OP: 0730
P/N: 1331200-2-TST   SN: 108

FINAL CPT TDS-4

TEST ENG: [signature] Date: 2-19-00
Quality: [signature] 7A 194 2-20-00

Y=957.575µ ΔY=43.1mV

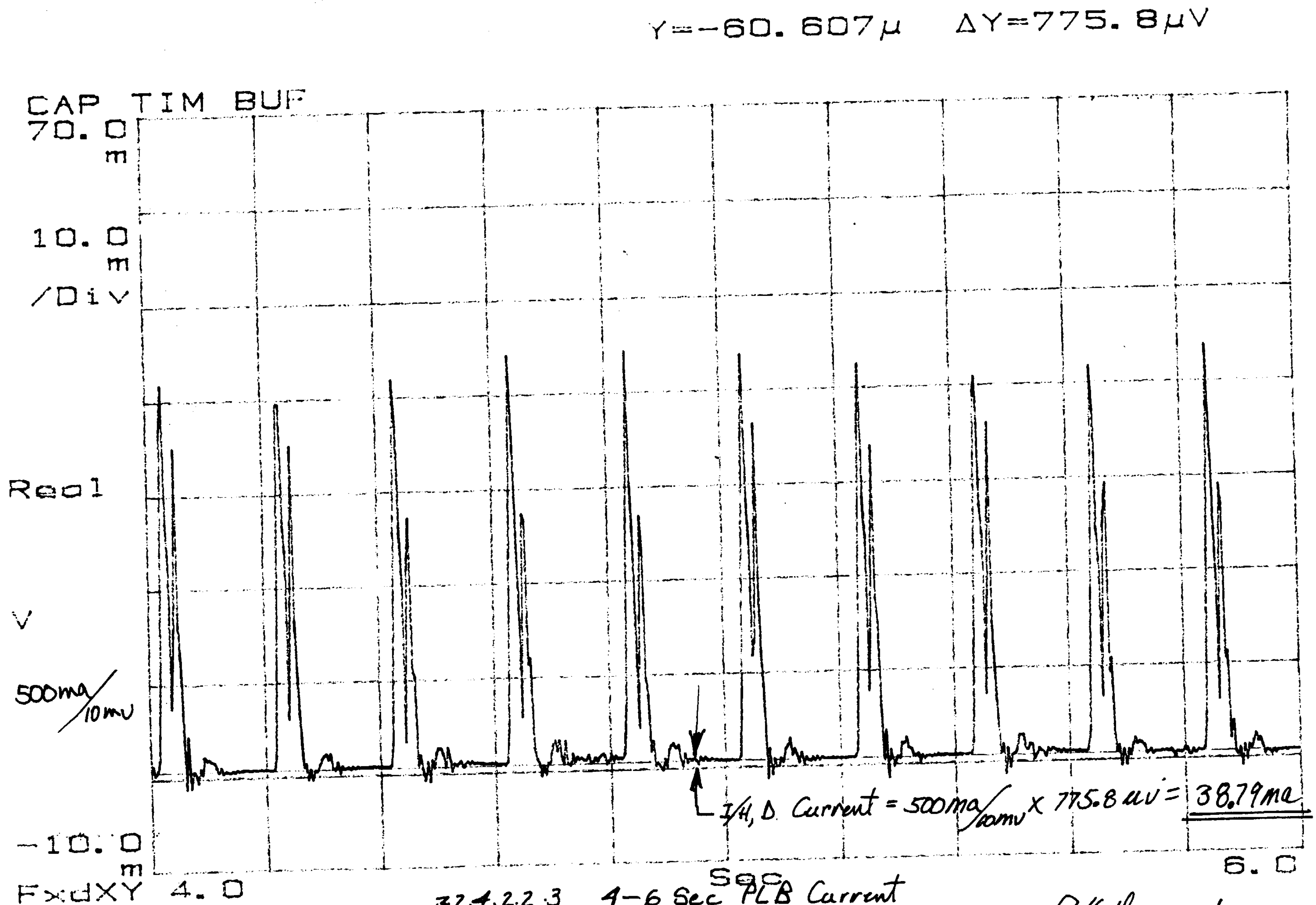


324.2.2.3 4-6 Sec PLB Current
Peak Current

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TDS-4

TEST ENG: [signature] Date: 2-19-00
Quality: [signature] 7A 194 2-20-00



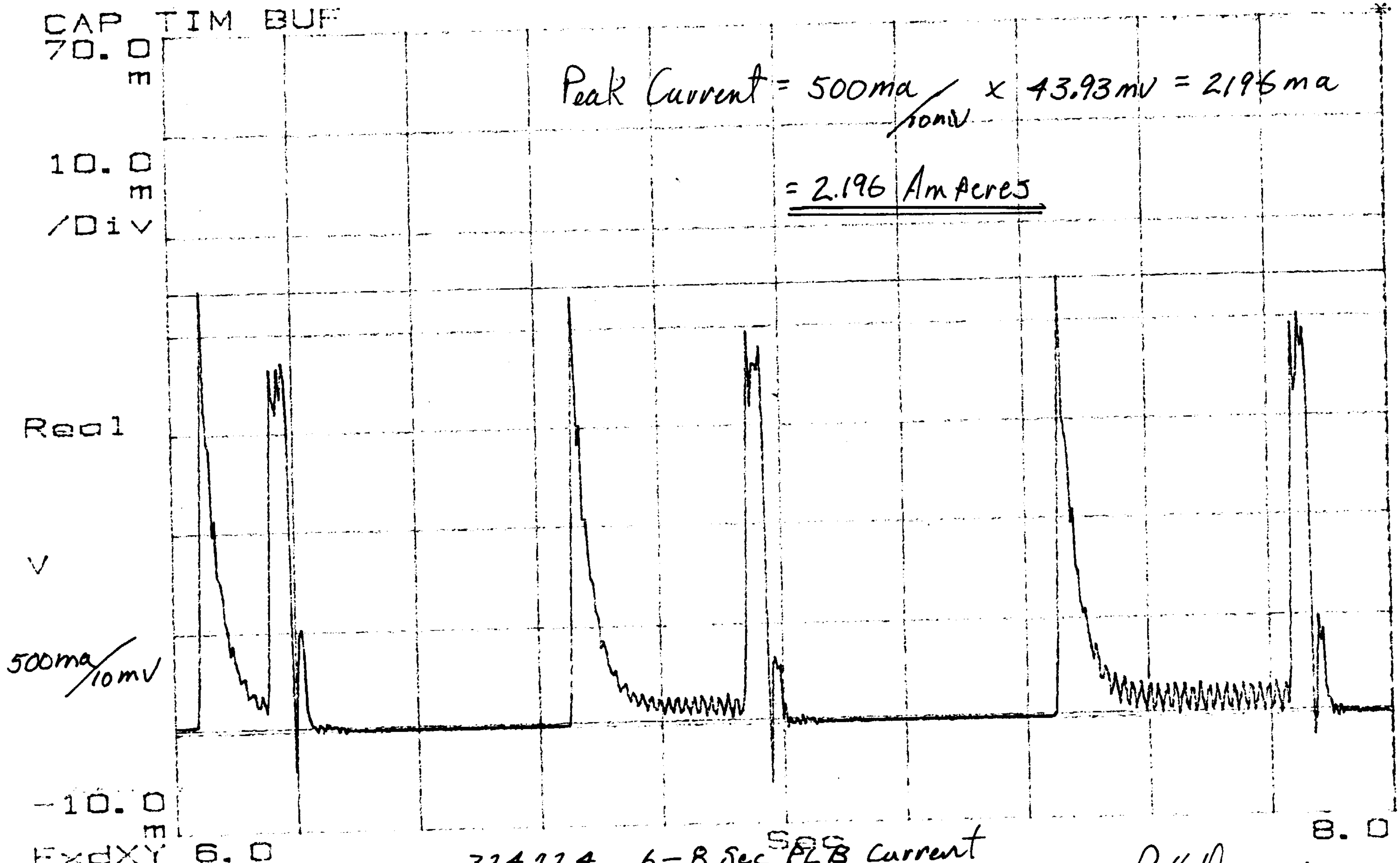
32.4.2.2.3 4-6 Sec PLB Current
I/H, D Current

S/O: 335079 OP: 0730
P/N: 31200-2-TST SN: 108

FINAL CPT TDS-4

TEST ENG: Date: 2-19-00
Quality: 7A 194 2-20-00

Y=44.3515m ΔY=43.93mV

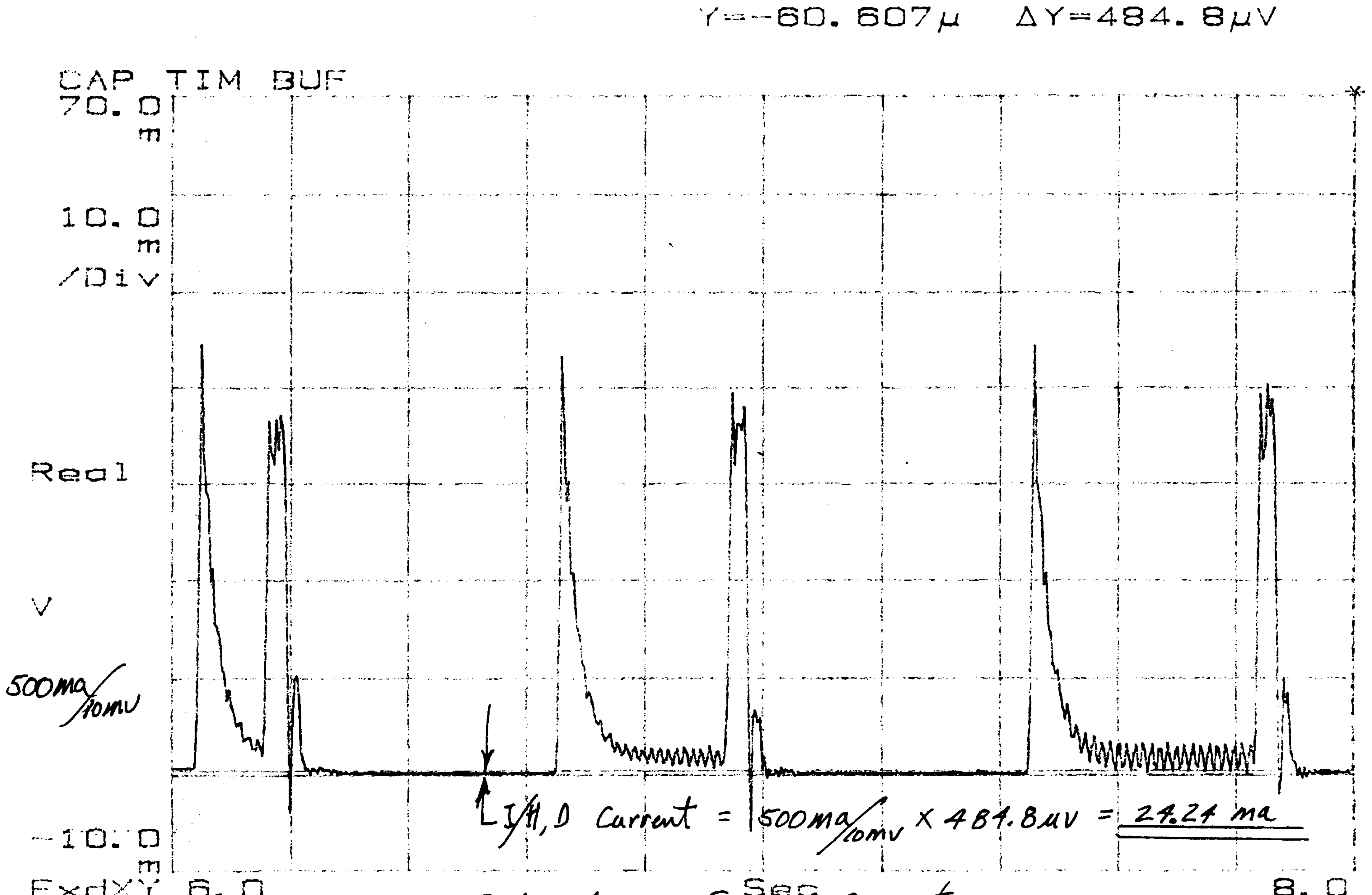


324.22.4 6-8 Sec PLB Current
Peak Current

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT TOS-4

TEST ENG: [signature] Date: 2-19-00
Quality: [signature] 7A 194 2-20-00



324.2.2.4 6-8 Sec FLB Current
I/H, D Current

FINAL CPT TDS-4

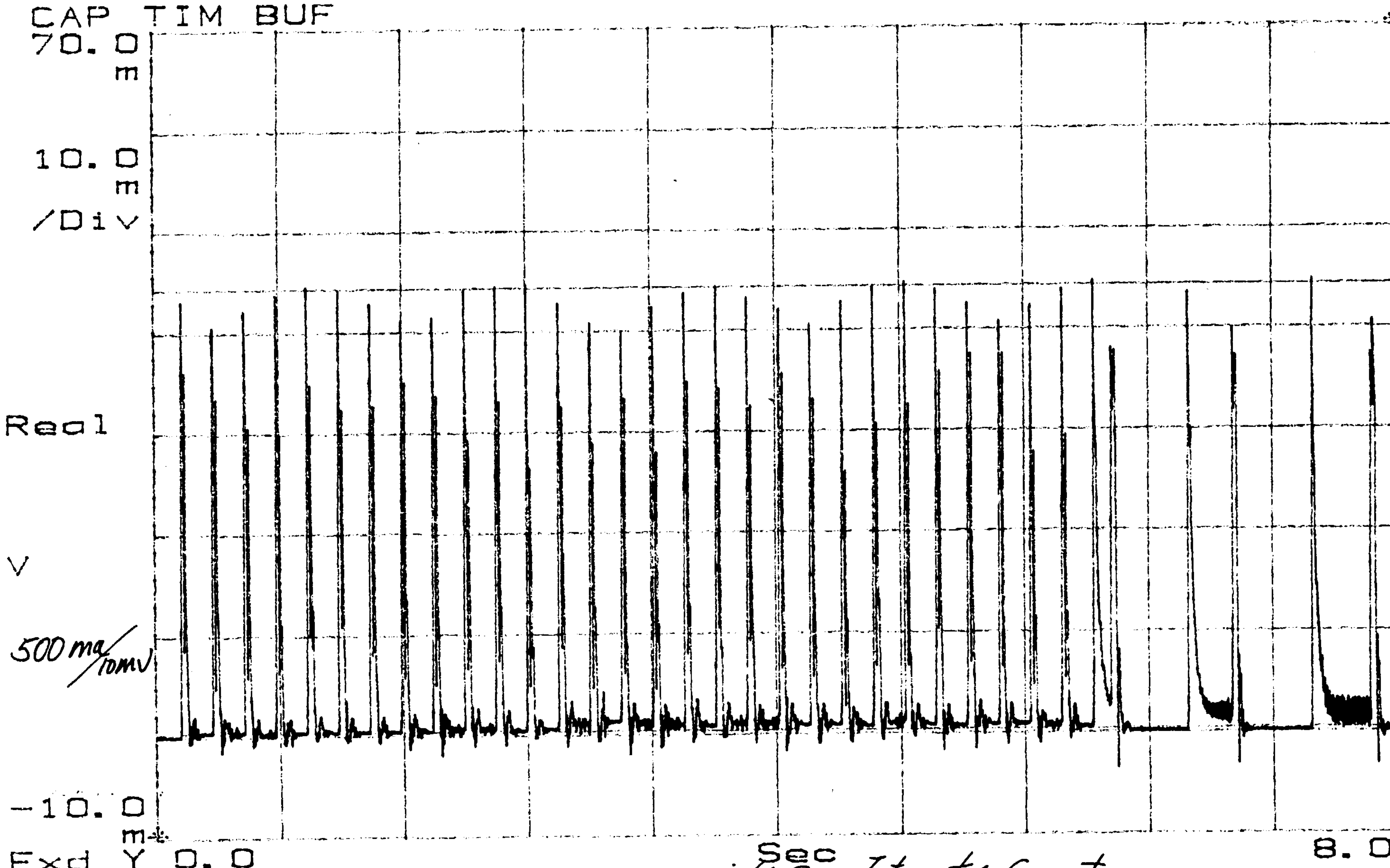
S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

TEST ENG: [signature] Date: 2-19-00

Quality: [signature] 7A 194 2-20-00

Y=44.303m ΔY=43.93mV



3.2.4.2.2.5 Eight Sec Integrated Current

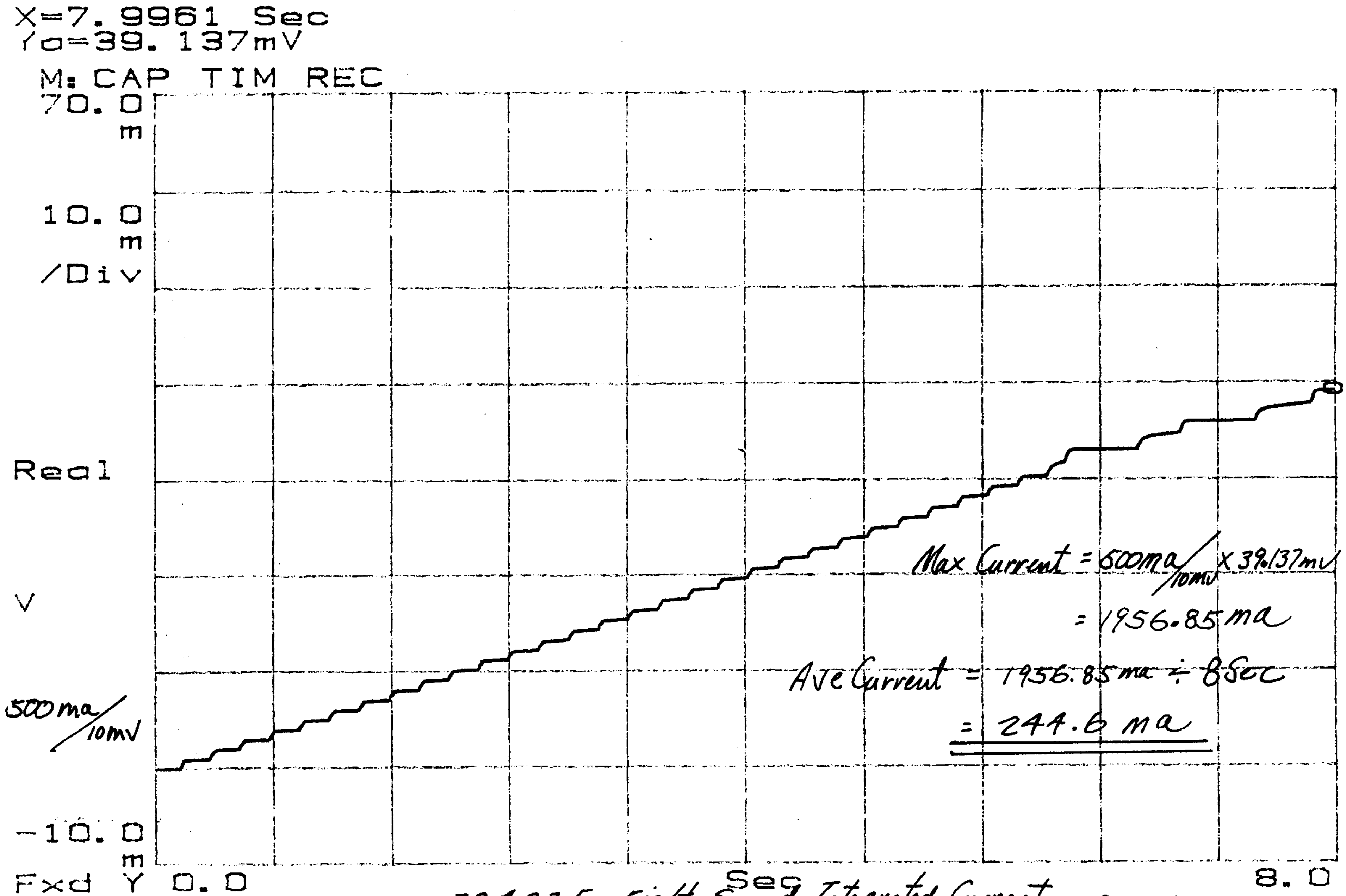
S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT

TDS-4

TEST ENG: [signature] Date: 2-19-00

Quality: [signature] 7A 194 2-20-00



3.2.4.2.2.5 Eight Second Integrated Current

S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

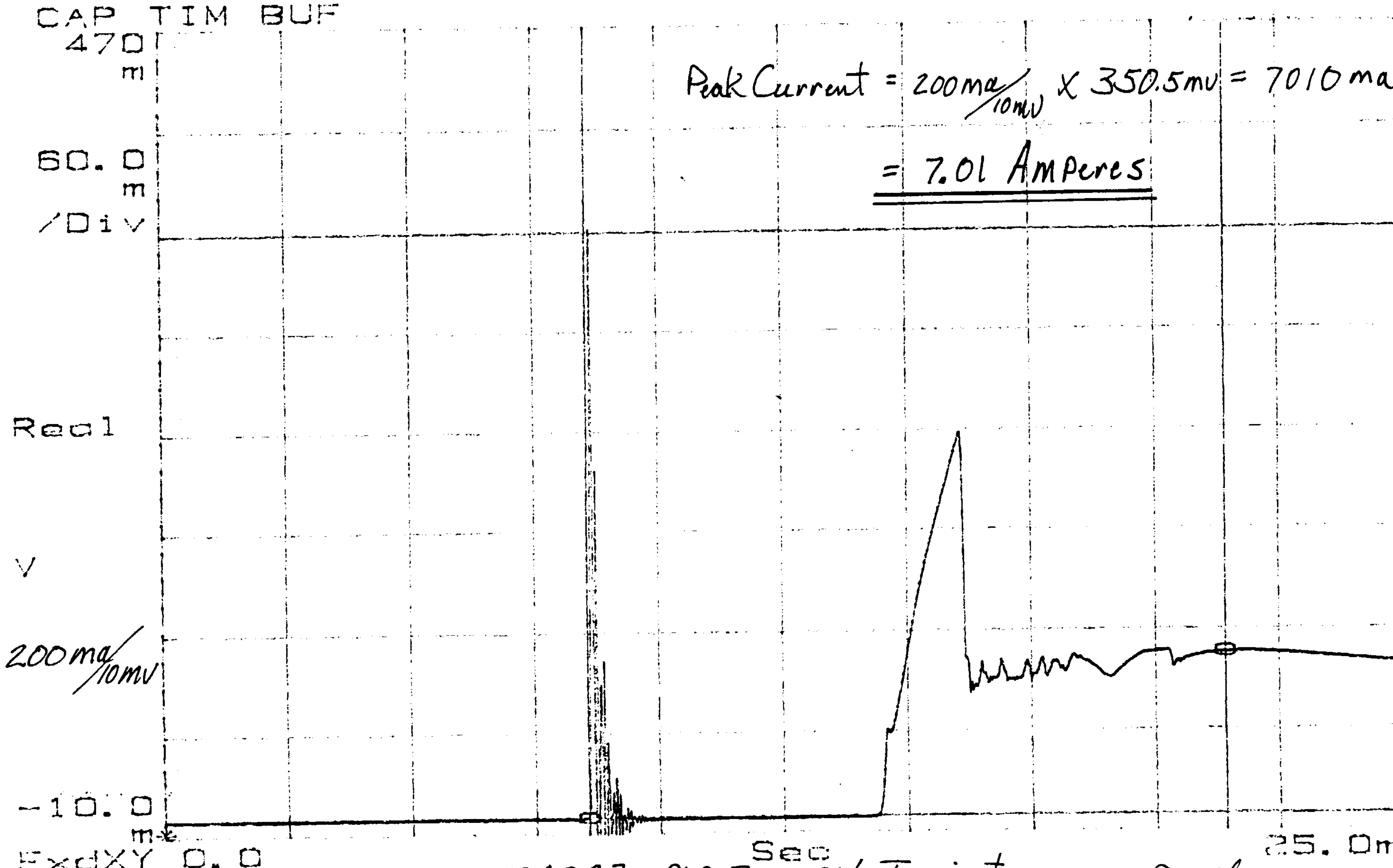
FINAL CPT

TDS-4

TEST ENG: [signature] Date: 2-19-00

Quality: [signature] (7A 194) 2-2000

X=8.562mS ΔX=12.87mS Y=350.145m ΔY=350.5mV
Ya=-666.73μ ΔYa=97.03mV

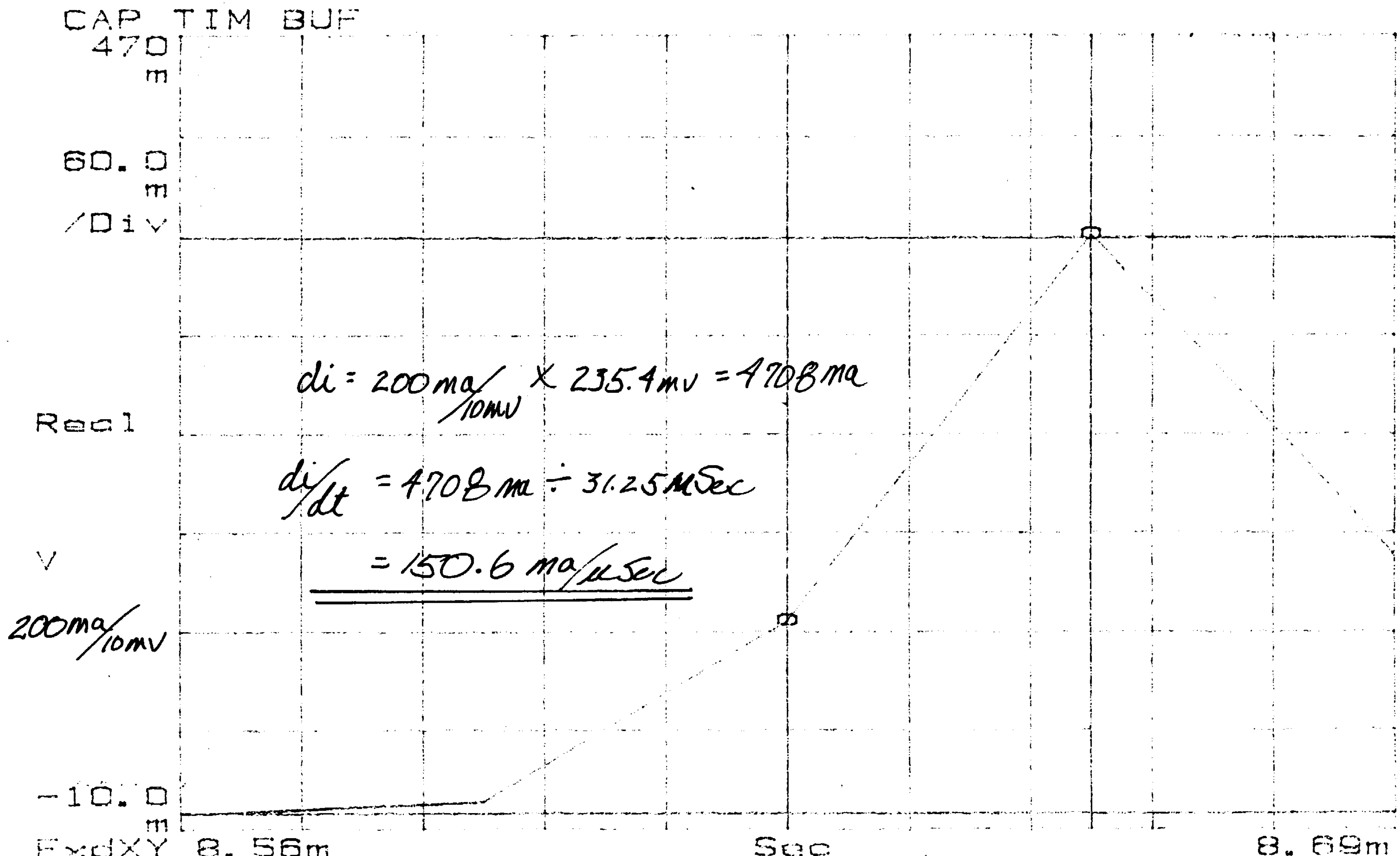


324.2.2.7 PLB Turn-ON Transient

S/O: 335079 OP: 0730 TDS-4 TEST ENG: [signature] Date: 2-20-00

P/N: 1331200-2-TST SN: 108 FINAL CPT Quality: [signature] 2-20-00

X=8.656mS ΔX=31.25µS Y=350.145m ΔY=350.5mV
Ya=351.981m ΔYa=235.4mV



3.2.4.2.2.7 PLB Turn-ON

di/dt TDS-4

FINAL CPT

S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

TEST ENG: [signature] Date: 2-20-00

Quality: [signature] 7A 194 2-20-00

TEST DATA SHEET 4
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.7)

Peak current

Paragraph	Parameter	Measured or Calculated	Required	Pass/ Fail
3.2.4.2.2.1	From -0.1 to two seconds			
	Peak Current = I_p	___Amps	2.2 amps max	
3.2.4.2.2.2	From 2 to 4 seconds			
	Peak Current = I_p	___Amps	2.2 amps max	
3.2.4.2.2.3	From 4 to 6 seconds			
	Peak Current = I_p	___Amps	2.2 amps max	
3.2.4.2.2.4	From 6 to 8 seconds			
	Peak Current = I_p	___Amps	2.2 amps max	
3.2.4.2.2.5	Eight Sec. Integrated Current Measurement			
	Current	___mA	none	
3.2.4.2.2.7	Turn-on Transient:			
	Turn-on pulse width Peak Current = I_p dI/dT	N/A ms ___Amps 242.5 mA/µs	 ≤9.6 Amps 846 mA/µs *	

* Refer to Figure 10.

Bus current during the I/H,D period

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.1	From -0.1 to 2 seconds	N/A ___mA	N/A
3.2.4.2.2.2	From 2 to 4 seconds	43.6 mA	N/A
3.2.4.2.2.3	From 4 to 6 seconds	N/A ___mA	N/A
3.2.4.2.2.4	From 6 to 8 seconds	N/A ___mA	N/A

Bus current during warm cal, cold cal, and nadir

Paragraph	Parameter	Measured	Pass/ Fail
3.2.4.2.2.6 (2)	Warm cal	N/A ___mA	N/A
3.2.4.2.2.6 (3)	Cold cal	___mA	N/A
3.2.4.2.2.6 (4)	Nadir	___mA	N/A

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT

Op. 8050 AMSU. #1

R. Hail 2/25/00
Test Systems Engineer Date

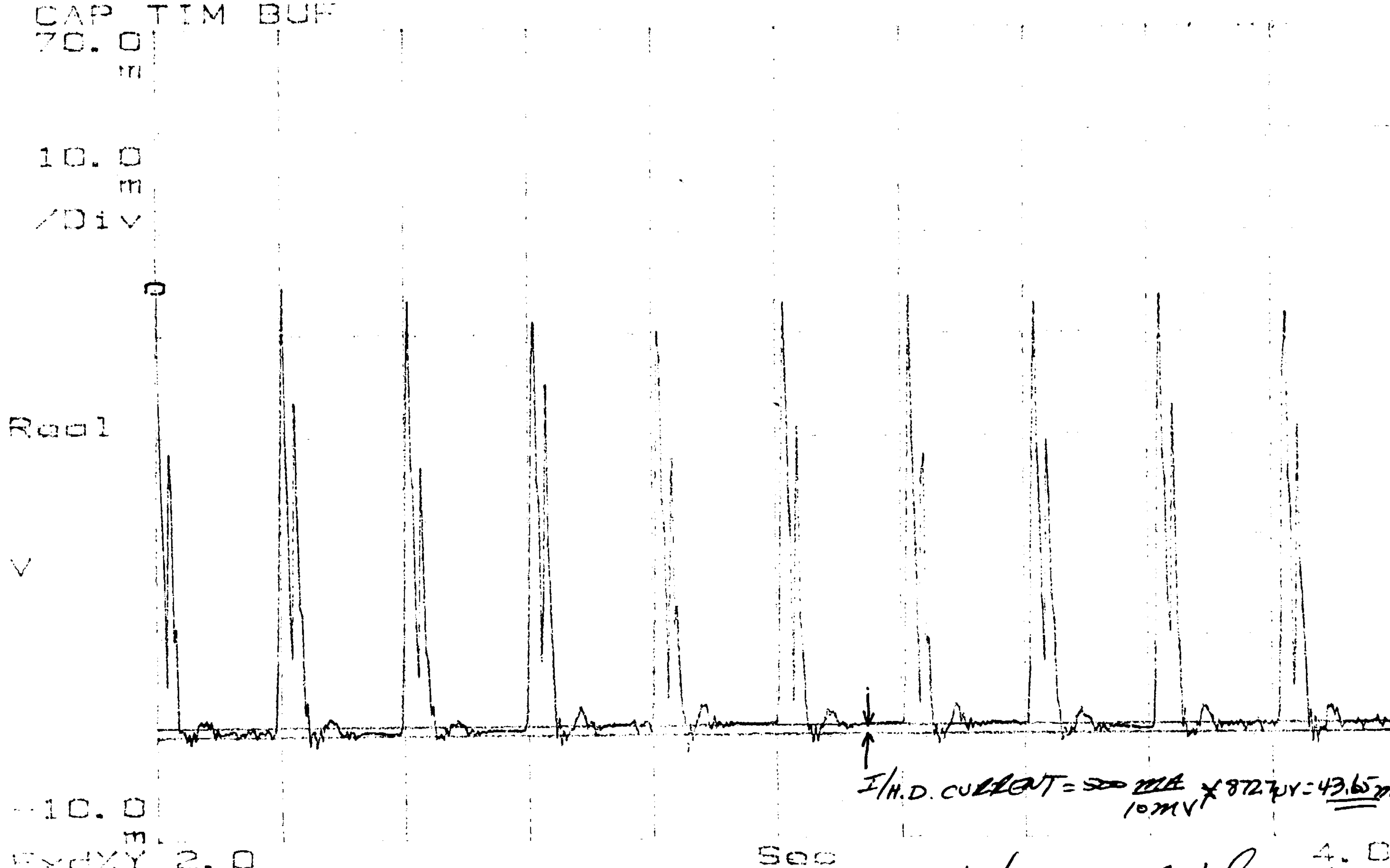
J. Sanford 2-25-00
Customer Representative Date

Date
(Flight Hardware Only)

25FEB00
Quality Control

X=2.0 Sec
Yo=44.6563mV

Y=230.301μ ΔY=872.7μV

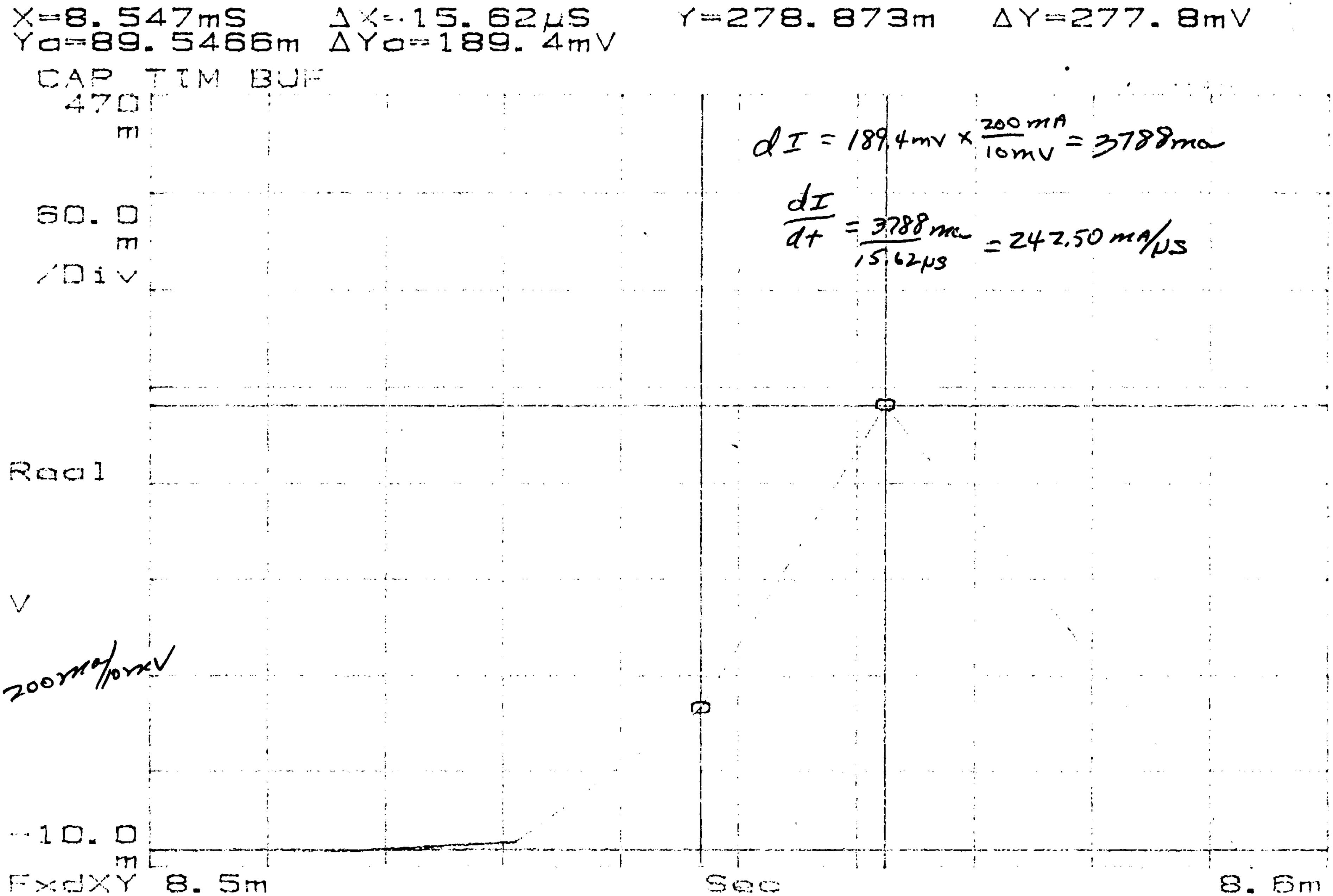


I/H.D. CURRENT = ~~500~~ $\frac{mA}{10mV}$ × 872.7μV = 43.65 ma

S.O. 335079 TDS-4 P.3.2.4.2.2.2 A2 S/N 108 2/25/00
ADDITIONAL TESTS

AMEND #1
OP. 8050

R. Hail 2/25/00
Judith Hervey
25 FEB 00



$$dI = 189.4mV \times \frac{200\,mA}{10\,mV} = 3788\,ma$$

$$\frac{dI}{dt} = \frac{3788\,ma}{15.62\,\mu s} = 242.50\,mA/\mu s$$

P. 3.2.4.2.2.7
S.O. 335A79

ADDITIONAL
TESTS

A2 S/N 108
TDS 4

2/25/00
R. Hird

TEST DATA SHEET 4
+28 Pulse Load Bus (Paragraph 3.2.4.2.2.1-3.2.4.2.2.7)

Peak current

Paragraph	Parameter	Measured or Calculated	Required	Pass/ Fail
3.2.4.2.2.1	From -0.1 to two seconds			
	Peak Current = I_p	2.191 Amps	2.2 amps max	Pass
3.2.4.2.2.2	From 2 to 4 seconds			
	Peak Current = I_p	2.199 Amps	2.2 amps max	Pass
3.2.4.2.2.3	From 4 to 6 seconds			
	Peak Current = I_p	2.155 Amps	2.2 amps max	Pass
3.2.4.2.2.4	From 6 to 8 seconds			
	Peak Current = I_p	2.196 Amps	2.2 amps max	Pass
3.2.4.2.2.5	Eight Sec. Integrated Current Measurement			
	Current	244.6 mA	none	Pass
3.2.4.2.2.7	Turn-on Transient:			
	Turn-on pulse width Peak Current = I_p dI/dT	12.87 ms 7.01 Amps 150.6 mA/µs	≤9.6 Amps 846 mA/µs *	PASS

* Refer to Figure 10.

Bus current during the I/H,D period

Paragraph	Parameter	Measured or Calculated	Pass/ Fail
3.2.4.2.2.1	From -0.1 to 2 seconds	41.21 mA	N/A
3.2.4.2.2.2	From 2 to 4 seconds	75.15 mA	N/A
3.2.4.2.2.3	From 4 to 6 seconds	38.79 mA	N/A
3.2.4.2.2.4	From 6 to 8 seconds	24.29 mA	N/A

Bus current during warm cal, cold cal, and nadir

Paragraph	Parameter	Measured	Pass/ Fail
3.2.4.2.2.6 (2)	Warm cal	11.2 mA	N/A
3.2.4.2.2.6 (3)	Cold cal	11.21 mA	N/A
3.2.4.2.2.6 (4)	Nadir	49.8 mA	N/A

OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT

Test Systems Engineer 2-20-00 Date

QA 194

Quality Control 2-20-00

Customer Representative 2-20-00 Date
(Flight Hardware Only)

TEST DATA SHEET 5
+28V Analog Telemetry Bus (Paragraph 3.2.4.2.3)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	+28V ATB Bus Voltage (V_{at}) (Measured)	28.28 Volts	28.0 ±.5	PASS
3	Av. Current (I_a)	1.18 mA	7 mA max	PASS
4	+28V ATB Bus Power = I_a X V_{at}	33.37mW	200 mW max	PASS

Op. 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 106

Circle Test: 1st CPT Final CPT Sub CPT ________

Ken Shain 2/19/00
Test Systems Engineer Date

Stella M. Gonzales 2/19/00
Quality Control

D Brown 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

TEST DATA SHEET 6
+10V Interface Bus Voltage (Paragraph 3.2.4.2.4.1)

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
3	Av. Current (I_a)	7.56 mA	10 ma max	PASS
3	+10V Interface Bus (V_{ib}) (Measured)	9.08 Volts	9.0 ±1.0 V	PASS
4	+10 Interface Bus Power = I_a X V_{ib}	68.64 mW	100 mW max	PASS

Op. 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

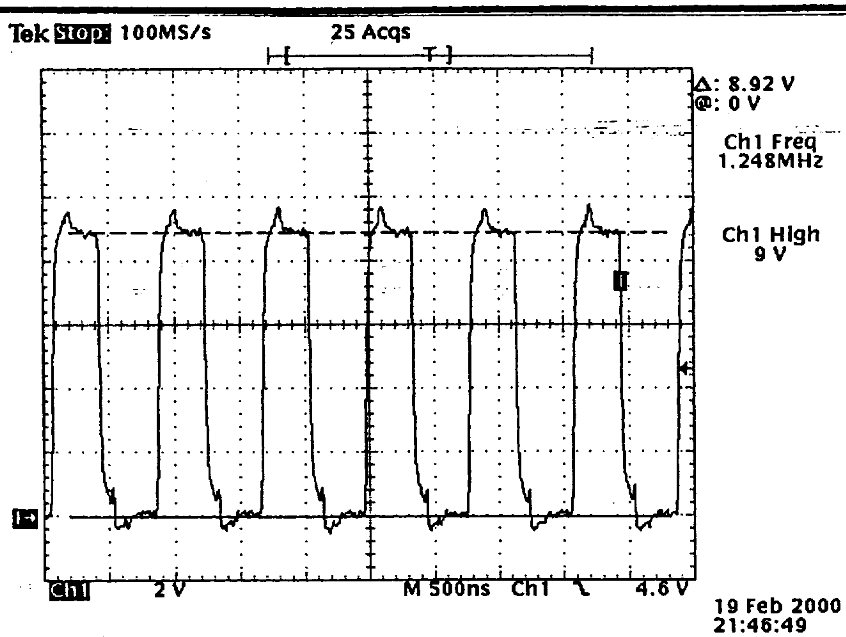
Circle Test: 1st CPT Final CPT Sub CPT ________

2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

2/19/00
Test Systems Engineer Date

2/19/00
Quality Control

TEST DATA SHEET 7
1.248 MHz Clock Signal Verification (Paragraph 3.2.4.3.2.1)



S/O: 335079 OP: 0730 1.248 MHz Clock
P/N: 1331200-2-TST SN: 108 FINAL CPT
P 3.2.4.3.2.1 TDS 7
TEST ENG: K Shaw Date: 2/19/00
Quality: Stella M Gonzales 2/19/00

Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
5	Clock Frequency	1.248 MHz	1.248 ±10%	PASS
	Clock Amplitude	9.0 Volts	9.0 ±1.0V	PASS

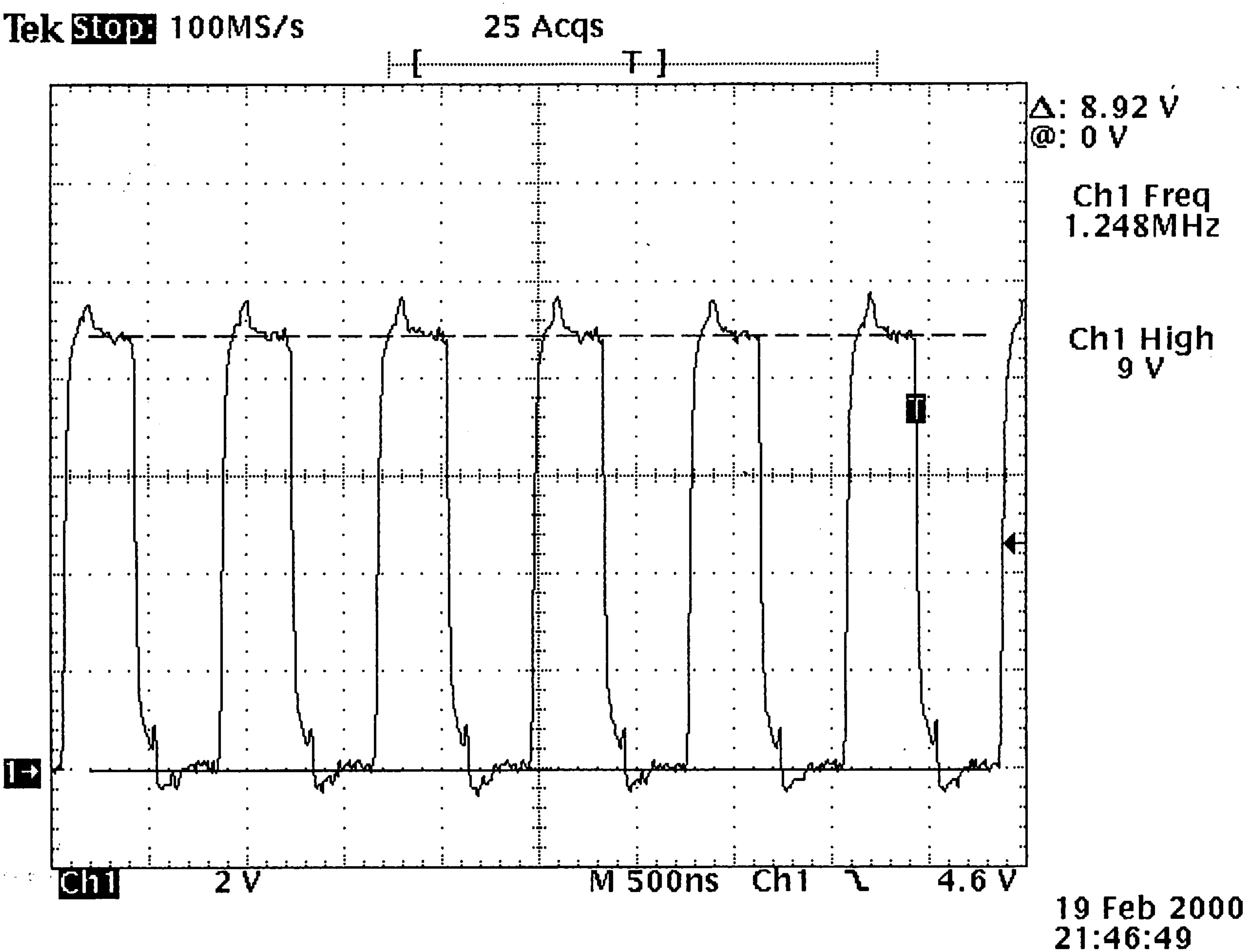
Op. 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

Ken Shaw 2/19/00
Test Systems Engineer Date

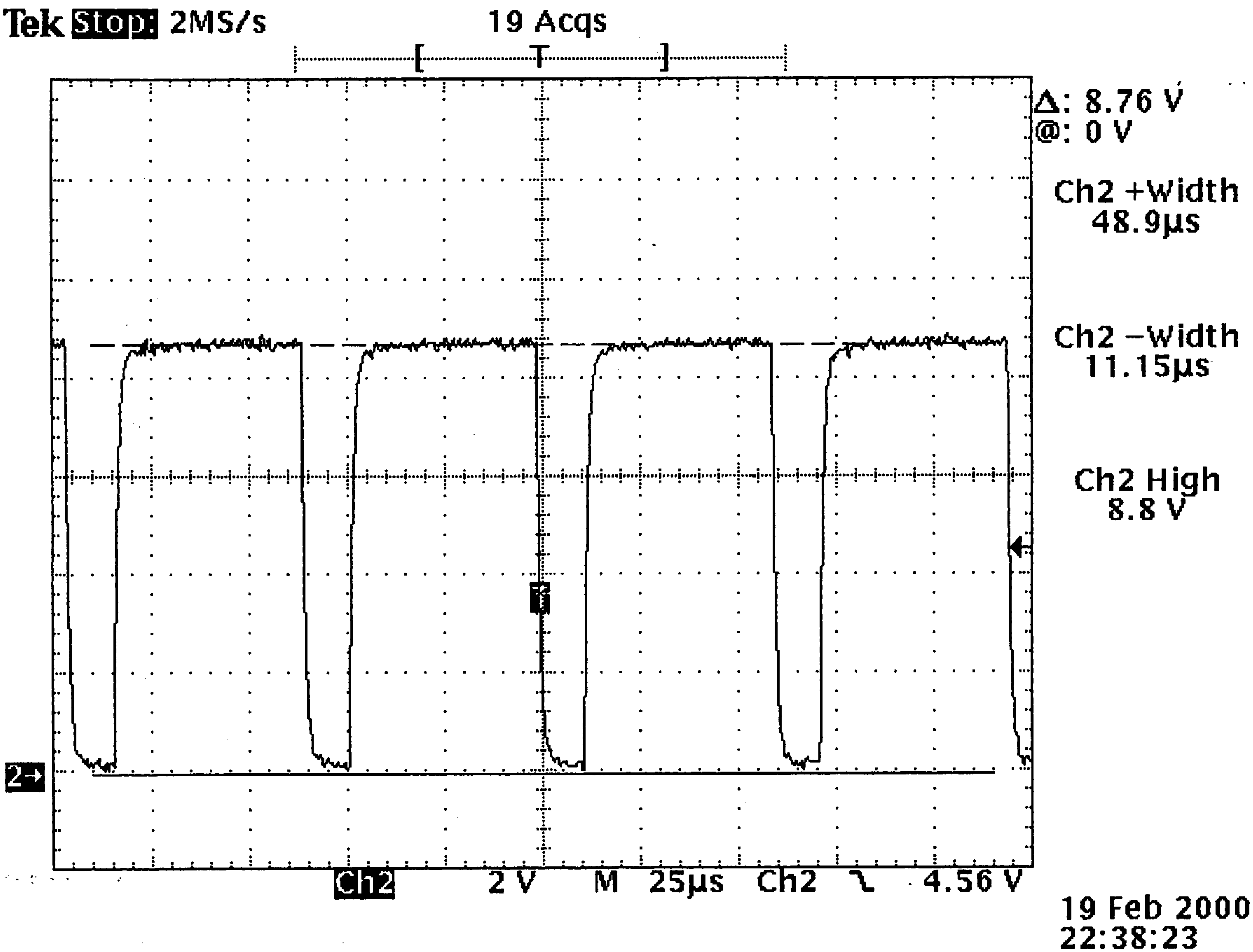
J. Sanford 2-20-00
Customer Representative Date
(Flight Hardware Only)

Stella M. Gonzales 2/19/00
Quality Control



S/O: 335079 OP: 0730 1.248 MHz Clock TEST ENG: K. Shane Date: 2/19/00

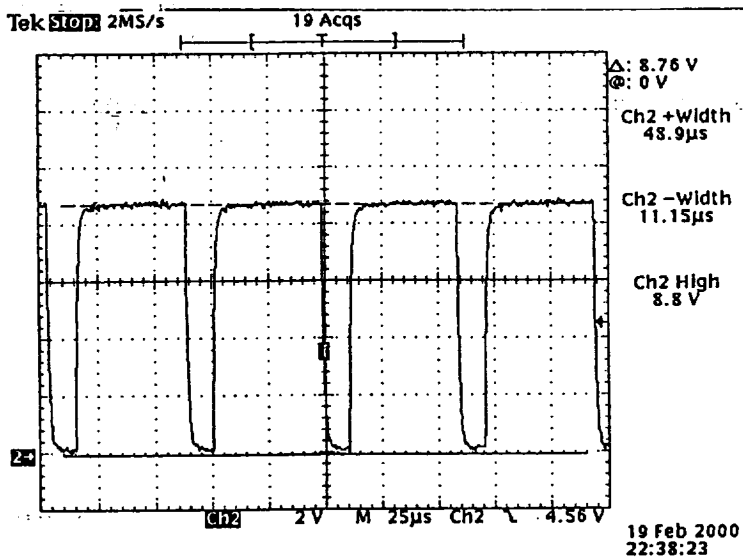
P/N: 1231200-2-TST SN: 108 FINAL C.PT Quality [signature] 2/19/00



S/O: 335079 OP: 0730 "C1" Shift Pulse TEST ENG: K Shaw Date: 2/19/00

P/N: 1331200-2-TST SN: 108 FINAL CPT Quality Estella M. Gonzales 7A 200

TEST DATA SHEET 8
"C1" Shift Pulse Verification (Paragraph 3.2.4.3.2.2)



S/O: 335079 OP: 0730 "C1" Shift Pulse TEST ENG: K Shane date: 2/19/00
P/N: 1331200-2-TST SN: 108 FINAL CPT Quality Estella M. Gonzalez 2/19/00
#3343322 TDS8

Parameter	Measured/ Calculated	Required	Pass/ Fail
Pulse Timing (A) *	48.90 µs	48 µs ± 10%	PASS
Pluse Timing (B) *	11.15 µs	12 µs ± 10%	PASS
Pulse Amplitude	8.80 Volts	9.0 ± 1.0V	PASS

* Refer to Figure 18 for location of the pulse timing A and B.

Op. 0730

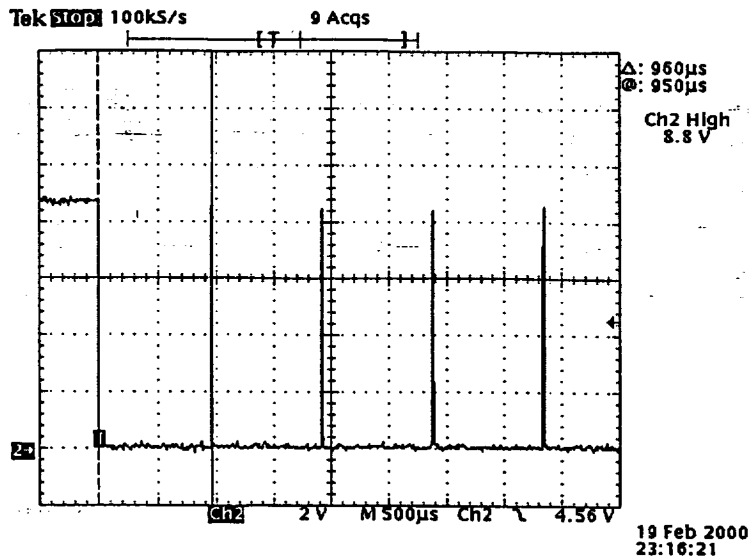
METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

Kim Shane 2/19/00
Test Systems Engineer Date

J. Sanford 2-20-00
Customer Representative Date
Date
(Flight Hardware Only)

Estella M. Gonzalez 2/19/00
Quality Control

TEST DATA SHEET 9
"A1" Select Pulse Verification (Paragraph 3.2.4.3.2.3)



S/O: 335079 OP: 0730 'A1' Select Pulse TEST ENG: K. Shane date: 2/19/00
P/N: 1331200-2-TST SN: 108 FINAL CPT Quality
¶ 3.2.4.3.2.3 TDS9

Parameter	Measured/ Calculated	Required	Pass/ Fail
Select Pulse Timing (F) *	960 μs	961.5 μs± 10%	PASS
Select Pulse Amplitude	8.80 Volts	9.0 ±1.0V	PASS

* Refer to Figure 18 for location of the pulse timing F

Op. 0730

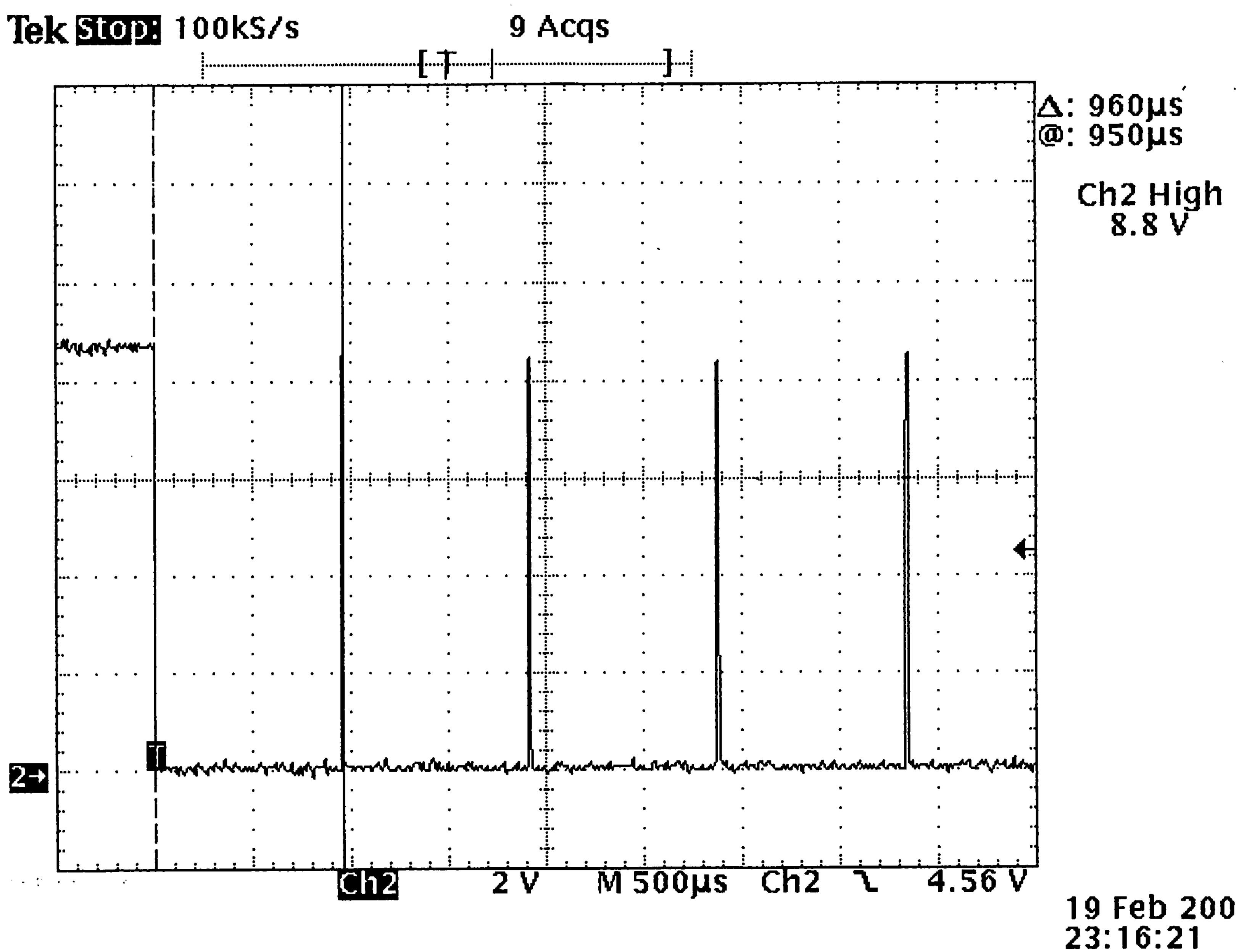
METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT (Final CPT) Sub CPT ______

Ken Shane 2/19/00
Test Systems Engineer Date

J. Englund 2-20-00
Customer Representative Date
Date
(Flight Hardware Only)

Stella M. Vargalez 2/19/00
Quality Control



S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

"A1" Select Pulse

FINAL CPT

TEST ENG: K. Shaw Date: 2/19/00

Quality: Estella G. Gonzalez 2/19/00 QA 200

Tek Stop: 200kS/s 410 Acqs

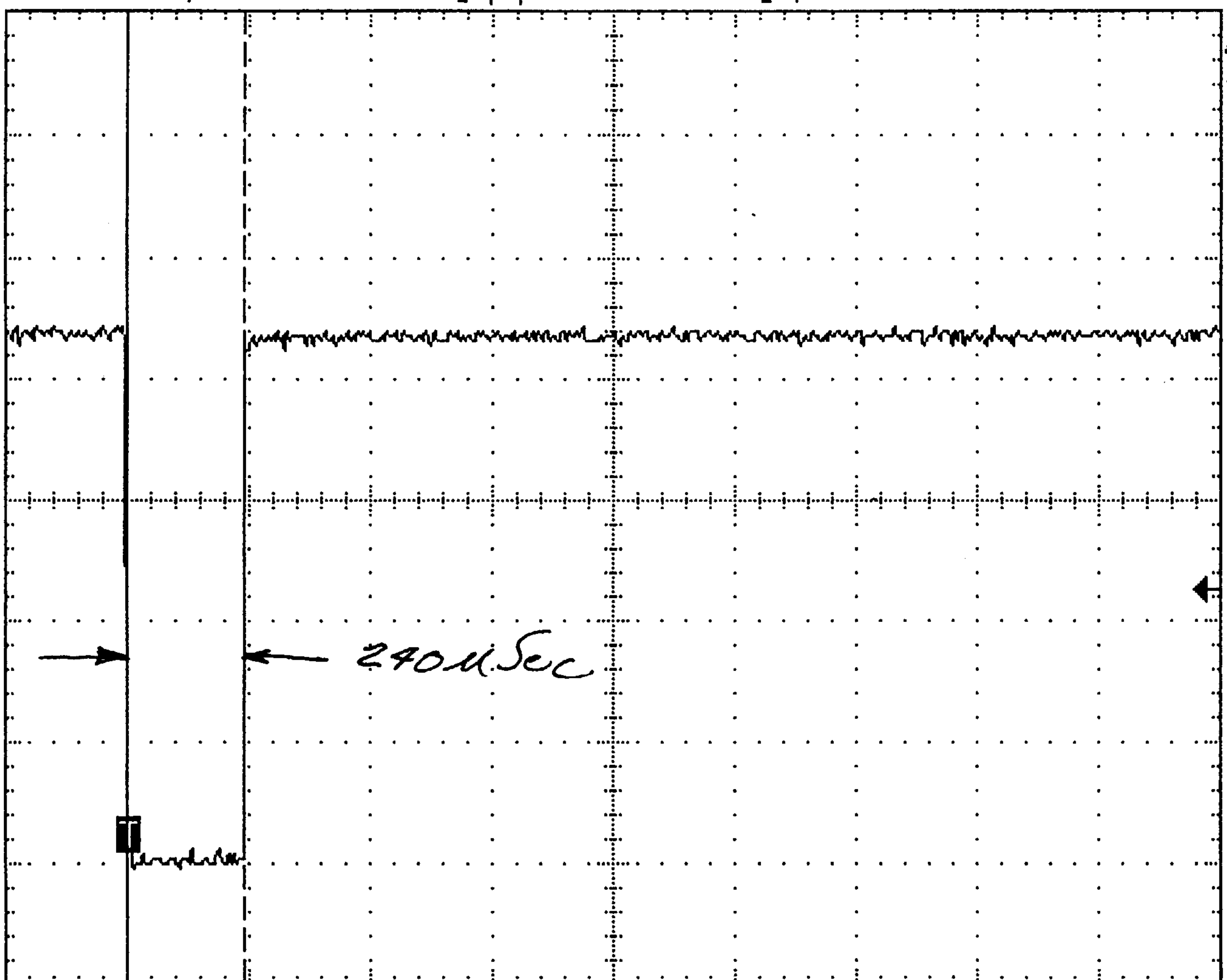
Δ: 240µs
@: −5µs

Ch2 High
8.8 V

8.8V —

8 Sec
SYNC
PULSE
J2 - 7

0.0V — 2→



Ch2 2 V M 250µs Ch2 ↘ 4.56 V

Period = 8.000049 Sec
Measured by HP5316A
47109
Cal Due: 9-20-00

20 Feb 2000
10:46:06

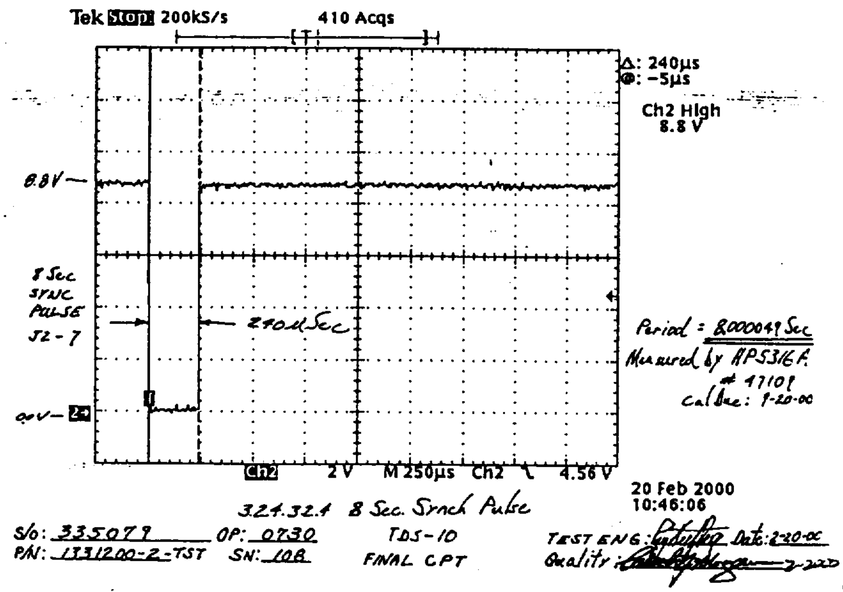
3.2.4.3.2.4 8 Sec. Synch Pulse

S/O: 335079 OP: 0730 TDS-10

TEST ENG: [signature] Date: 2-20-00

Quality: [signature] 7A 194 2-20-00

TEST DATA SHEET 10
"8 Seconds" Frame Sync Pulse (Paragraph 3.2.4.3.2.4)



Step	Parameter	Measured/ Calculated	Required	Pass/ Fail
1*	Frame Sync Pulse Timing	8.000049 Sec	8 Sec ±10%	PASS
	Frame Sync Pulse Timing (C)**	240.0 µs	240.4 µs ±10%	PASS
	Frame Sync Pulse Amplitude	8.8 Volts	9.0 ±1.0V	PASS

* Measure timing of 8-sec FSP by using HP 5316A Universal Counter.
** Refer to Figure 18 for location of the timing pulses for C.

OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT (Final CPT) Sub CPT ________

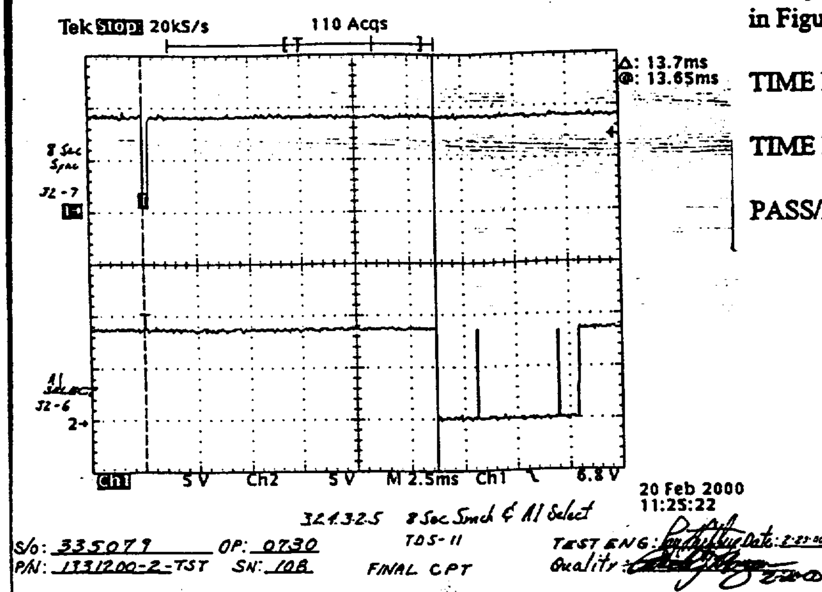
Test Systems Engineer 2-20-00 Date

Quality Control 7A 194 2-20-00

Customer Representative 2-20-00 Date
Date
(Flight Hardware Only)

TEST DATA SHEET 11 (Sheet 1 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 8 seconds Frame sync pulse.



Verify that the timing between H and I is as shown in Figure 18.

TIME MEASURED: 13.7 mSec

TIME REQUIRED: 13.7 ms ±10%

PASS/FAIL PASS

OP 10730

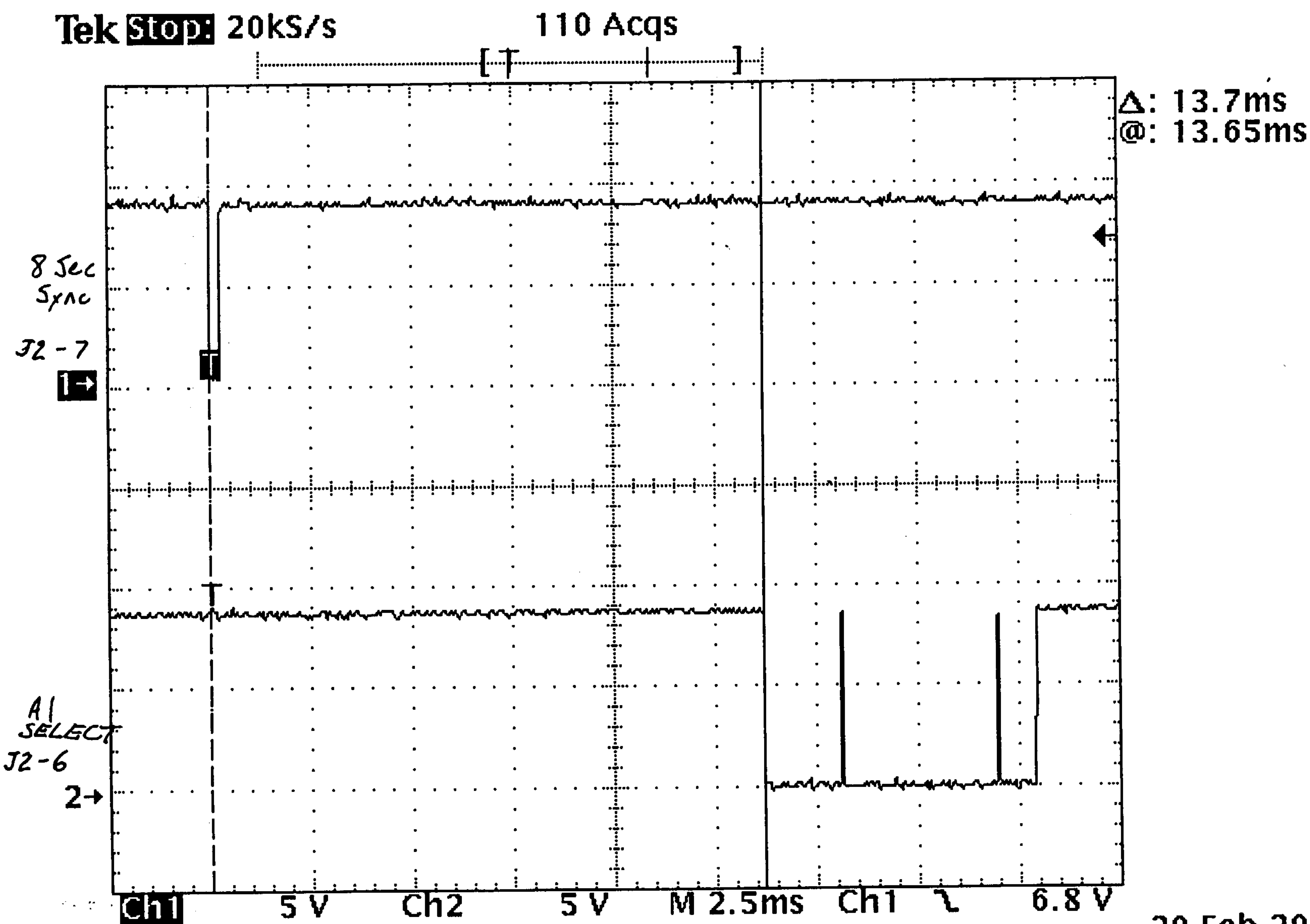
METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

2-20-00
Test Systems Engineer Date

2-20-00
Quality Control

2-20-00
Customer Representative Date
Date
(Flight Hardware Only)



20 Feb 2000
11:25:22

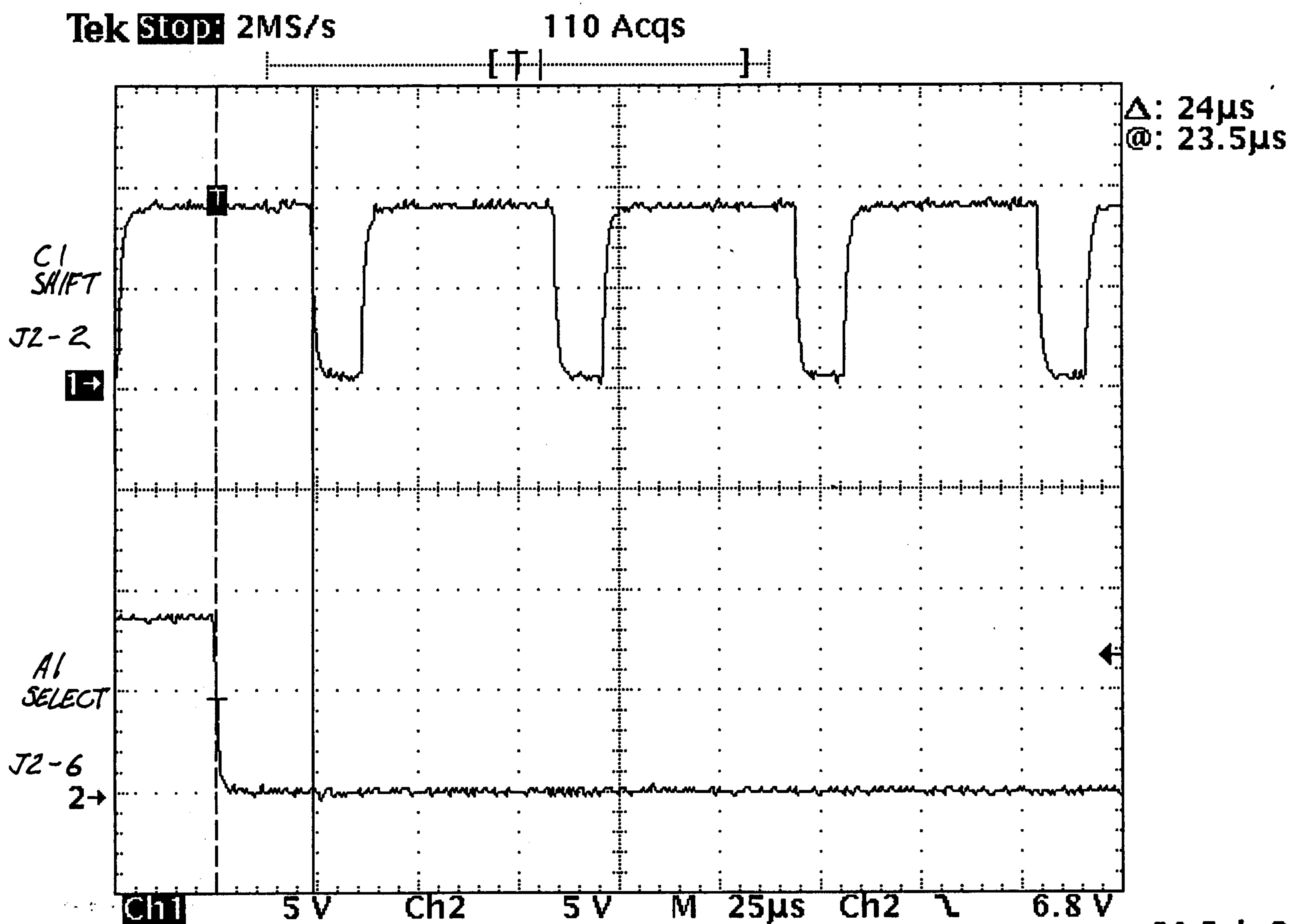
3.2.4.3.2.5 8 Sec Synch & A1 Select

TDS-11

S/O: 335079 OP: 0730
P/N: 1331200-2-TST SN: 108

FINAL CPT

TEST ENG: [signature] Date: 2-20-00
Quality: [signature] 7A 194 2-20-00



20 Feb 2000
11:34:46

3.2.4 3.2.5 A1 Select & C1 Shift

TDS-11

S/O: 335079 OP: 0730

P/N: 1331200-2-TST SN: 108

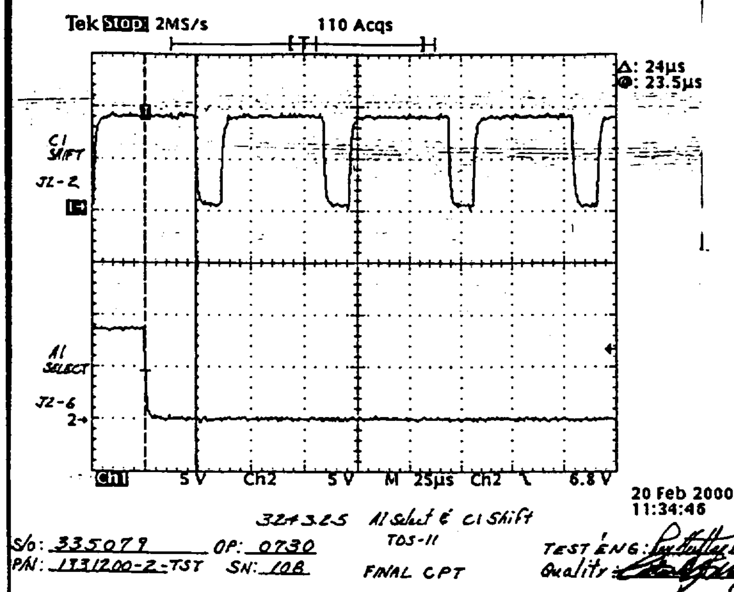
FINAL CPT

TEST ENG: [signature] Date: 2-20-00

Quality: [signature] 2-20-00

TEST DATA SHEET 11 (Sheet 2 of 2)
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the C1 Shift pulse.



Verify that the timing between I and E is as shown in Figure 18.

TIME MEASURED: 24.0 µSec

TIME REQUIRED: 24 µs ±10%

PASS/FAIL PASS

OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

2-20-00
Customer Representative Date
Date
(Flight Hardware Only)

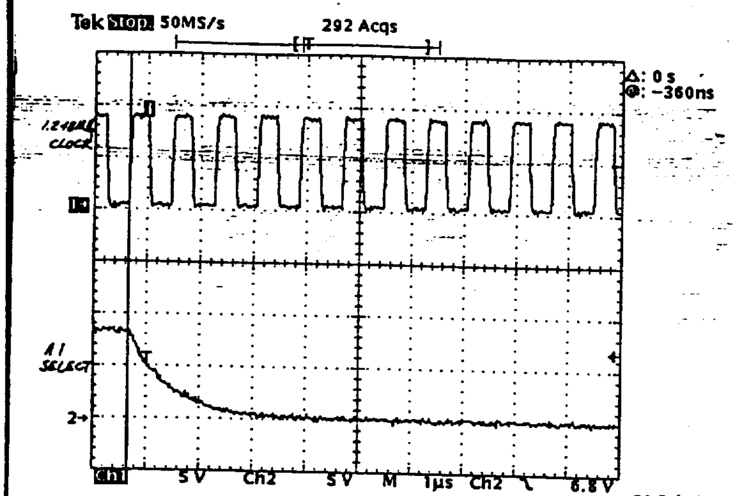
2-20-00
Test Systems Engineer Date

7A 194

2-20-00
Quality Control

TEST DATA SHEET 12
Synchronization Signals Relationship (Paragraph 3.2.4.3.2.5)

A1 Select pulse and the 1.248 MHz clock.



324325 1.248MHz Clock & A1 Select

S/O: 335079 OP: 0730 TDS-12
P/N: 1331200-2-TST SN: 108 FINAL CPT

TEST ENG: [signature] Date: 2-20-00
Quality: [signature] 2-20-00

Verify that the timing between I and J is as shown in Figure 18.

PASS/FAIL PASS

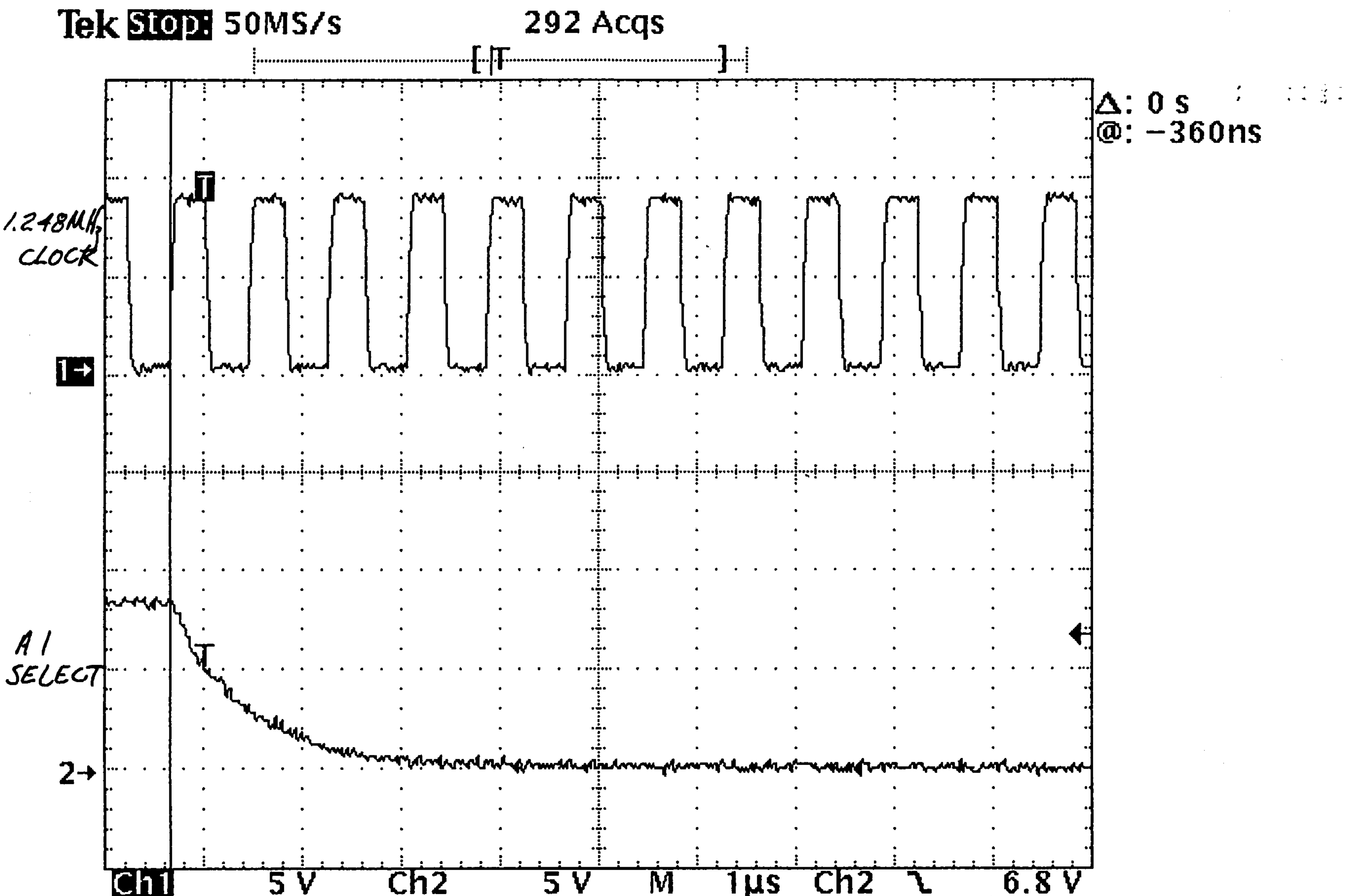
OP: 0730

METSAT/AMSU A2 System ~~CPT P/N~~ IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

[signature] 2-20-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] 2-20-00
Test Systems Engineer Date
[signature] 2-20-00
Quality Control



20 Feb 2000
12:34:54

3.2.4.3.2.5 1.248MHz Clock & A1 Select

TDS-12

s/n: 335079 OP: 0730

TEST ENG: [signature] Date: 2-20-00

Quality [signature] 7A 194 2-20-00

TEST DATA SHEET 13
Commands and Digital-B Telemetry Verification (Paragraphs 3.2.4.3.3.1, 3.2.4.3.3.2, and 3.2.4.3.3.3)

Test	Digital-B Commands Verification Via STE			Visual Inspection		Pass/Fail
	Command	Observed	Required	Observed	Required	
3.2.4.3.3.1 Module Totally Off	Scanner A2	OFF	OFF	ANT. IN W.L. POSITION	Antenna pointing to warm load.	PASS
	Module Power	DISCONNECT	Disconnect	N/A	N/A	
	Survival Htr. Power.	OFF	OFF	0	28V supply current=0	PASS
3.2.4.3.3.2 Survival Heater Power	Survival Heater ON	ON	ON	N/A	N/A	PASS
	Survival Heater OFF	OFF	OFF	N/A	N/A	PASS
3.2.4.3.3.3 Module Power Connect	Module Power	28.06V 1.2A	Connect	CONNECT	+28V DC current is between 0.5 and 3.2 amps.	PASS

Op.# 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ____

AMSU 7 SETT 2-19-00

Test Systems Engineer Date

[signature] 2/19/00 TA 275

Quality Control

[signature] 2-19-00

Customer Representative Date
Date
(Flight Hardware Only)

TEST DATA SHEET 14
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 1)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A2 Power	ON	ON	
	4 Compensator Motor Power	ON	ON	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 Cold MSB	ZERO	0	
	10 Cold LSB	ZERO	0	PASS

op# 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ______

AMSU T SEIT 2-19-00
Test Systems Engineer Date

R. [signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] 2/19/00 QA 275
Quality Control

TEST DATA SHEET 15
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 2)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A2 Power	OFF	OFF	
	4 Compensator Motor Power	OFF	OFF	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 Cold MSB	ZERO	0	
	10 Cold LSB	ZERO	0	PASS

METSAT/AMSU A2 System CPT P/N IS-1331200
Circle Test: 1st CPT Final CPT Sub CPT ________

OP.# 0730
Shop Order: 335079 S/N: 108

AMSU 7 SETF

2-19-00
Test Systems Engineer Date

R. [signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] 2/19/00 74 275
Quality Control

TEST DATA SHEET 16
Scanner Commands Verification (Paragraph 3.2.4.3.3.4, Step 3)

Test	Digital "B" Verification			Pass/Fail
	Command	Observed	Required	
Full Scan	1 Module Power	CONNECT	CONNECT	PASS
	2 Survival Heater	OFF	OFF	
	3 Scanner A2 Power	ON	ON	
	4 Compensator Motor Power	ON	ON	
	5 Antenna Warm Cal Pos.	NO	NO	
	6 Antenna Cold Cal Pos.	NO	NO	
	7 Antenna NADIR Position	NO	NO	
	8 Antenna Full Scan	YES	YES	
	9 Cold MSB	ZERO	0	
	10 Cold LSB	ZERO	0	PASS

op.# 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335074 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 BETT

2-19-00

Test Systems Engineer Date

2-19-00

Customer Representative Date
Date
(Flight Hardware Only)

2/19/00

Quality Control

7A 275

TEST DATA SHEET 17
Scanner Positions Commands (Paragraph 3.2.4.3.3.5)

Test	Digital "B" Verification				Pass/Fail
	Step/Description		Observed	Required	
Scanner Position Commands	1-Warm Cal.		WARM CAL	YES	PASS
	3-Cold Cal. Pos.	MSB	ZERO	0	
		LSB	ONE	1	
	5-Cold Cal. Pos.	MSB	ONE	1	
		LSB	ZERO	0	
	7-Cold Cal. Pos.	MSB	ONE	1	
		LSB	ONE	1	
	9-Cold Cal. Pos.	MSB	ZERO	0	
		LSB	ZERO	0	
	11-NADIR		YES	YES	
	13-Warm Cal		YES	YES	PASS

OP #0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ______

AMSU 7 SETT

2-19-00

Test Systems Engineer Date

Anita Navarro 2/19/00

Quality Control

2-19-00

Customer Representative Date

Date

(Flight Hardware Only)

TEST DATA SHEET 18
Digital-A Data Output Full Scan Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	2	2	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words (data entered in decimal system)

	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

Amend #1 Oper. 8050

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

[signature] AMSU B&EIT 2-24-00
Test Systems Engineer Date

[signature] 2-25-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] QA 269 25 FEB 00
Quality Control

AMSU A2-30 A2.EXE FULL SCAN MODE 24-FEB-00 19:58:18 SCAN NUMBER 206

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

COMMANDS

[9]	MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POSIT = NO	[15]
[10]	SURVIVAL HEATER POWER =	OFF	ANTENNA IN NADIR POSITION = NO	[16]
[11]	MODULE TOTALLY OFF =	ON	ANTENNA IN FULL SCAN MODE = YES	[17]
[12]	SCANNER A2 POWER =	ON	COLD CAL POSITION MSB = ZERO	[18]
[13]	COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB = ZERO	[19]
[14]	ANTENNA IN WARM CAL POSIT = NO			

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 3

Test data in support of TDS 18
S/O 335079 Amend #1, Oper. 8050
A2 S/N108 ¶ 3.2.4.3.4.1

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	3532
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	3538
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16306
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16708
5	DIGITAL B DATA BYTE 1	00000010	146	REFLECTOR POSITION 18	3380
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	3387
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16307
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16701
10	REFLECTOR POSITION 1	5967	154	REFLECTOR POSITION 19	3229
12	REFL POS 1 2ND LOOK	5967	156	REFL POS 19 2ND LOOK	3234
14	SCENE DATA BP 1 CH 1	16304	158	SCENE DATA BP 19 CH 1	16309
16	CH 2	16707	160	CH 2	16701
18	REFLECTOR POSITION 2	5809	162	REFLECTOR POSITION 20	3077
20	REFL POS 2 2ND LOOK	5814	164	REFL POS 20 2ND LOOK	3082
22	SCENE DATA BP 2 CH 1	16305	166	SCENE DATA BP 20 CH 1	16304
24	CH 2	16703	168	CH 2	16703
26	REFLECTOR POSITION 3	5656	170	REFLECTOR POSITION 21	2925
28	REFL POS 3 2ND LOOK	5661	172	REFL POS 21 2ND LOOK	2932
30	SCENE DATA BP 3 CH 1	16310	174	SCENE DATA BP 21 CH 1	16311
32	CH 2	16709	176	CH 2	16701
34	REFLECTOR POSITION 4	5506	178	REFLECTOR POSITION 22	2773
36	REFL POS 4 2ND LOOK	5511	180	REFL POS 22 2ND LOOK	2779
38	SCENE DATA BP 4 CH 1	16311	182	SCENE DATA BP 22 CH 1	16309
40	CH 2	16702	184	CH 2	16707
42	REFLECTOR POSITION 5	5355	186	REFLECTOR POSITION 23	2622
44	REFL POS 5 2ND LOOK	5359	188	REFL POS 23 2ND LOOK	2627
46	SCENE DATA BP 5 CH 1	16309	190	SCENE DATA BP 23 CH 1	16302
48	CH 2	16705	192	CH 2	16699
50	REFLECTOR POSITION 6	5201	194	REFLECTOR POSITION 24	2469
52	REFL POS 6 2ND LOOK	5207	196	REFL POS 24 2ND LOOK	2476
54	SCENE DATA BP 6 CH 1	16311	198	SCENE DATA BP 24 CH 1	16306
56	CH 2	16700	200	CH 2	16700
58	REFLECTOR POSITION 7	5052	202	REFLECTOR POSITION 25	2319
60	REFL POS 7 2ND LOOK	5056	204	REFL POS 25 2ND LOOK	2324
62	SCENE DATA BP 7 CH 1	16308	206	SCENE DATA BP 25 CH 1	16308
64	CH 2	16704	208	CH 2	16707
66	REFLECTOR POSITION 8	4899	210	REFLECTOR POSITION 26	2168
68	REFL POS 8 2ND LOOK	4903	212	REFL POS 26 2ND LOOK	2174
70	SCENE DATA BP 8 CH 1	16307	214	SCENE DATA BP 26 CH 1	16309
72	CH 2	16701	216	CH 2	16701
74	REFLECTOR POSITION 9	4746	218	REFLECTOR POSITION 27	2015
76	REFL POS 9 2ND LOOK	4752	220	REFL POS 27 2ND LOOK	2022
78	SCENE DATA BP 9 CH 1	16315	222	SCENE DATA BP 27 CH 1	16310
80	CH 2	16703	224	CH 2	16704
82	REFLECTOR POSITION 10	4595	226	REFLECTOR POSITION 28	1864
84	REFL POS 10 2ND LOOK	4600	228	REFL POS 28 2ND LOOK	1869
86	SCENE DATA BP 10 CH 1	16308	230	SCENE DATA BP 28 CH 1	16305
88	CH 2	16707	232	CH 2	16700
90	REFLECTOR POSITION 11	4443	234	REFLECTOR POSITION 29	1713
92	REFL POS 11 2ND LOOK	4448	236	REFL POS 29 2ND LOOK	1719

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	SCENE DATA BP 11 CH 1	16309	238	SCENE DATA BP 29 CH 1	16310
96	CH 2	16707	240	CH 2	16704
98	REFLECTOR POSITION 12	4291	242	REFLECTOR POSITION 30	1560
100	REFL POS 12 2ND LOOK	4297	244	REFL POS 30 2ND LOOK	1566
102	SCENE DATA BP 12 CH 1	16312	246	SCENE DATA BP 30 CH 1	16311
104	CH 2	16702	248	CH 2	16708
106	REFLECTOR POSITION 13	4140	250	REFLECTOR COLD CAL POS	16357
108	REFL POS 13 2ND LOOK	4146	252	REFL COLD CAL 2ND LOOK	16357
110	SCENE DATA BP 13 CH 1	16308	254	COLD CAL DATA 1 CH 1	16308
112	CH 2	16704	256	CH 2	16717
114	REFLECTOR POSITION 14	3987	258	COLD CAL DATA 2 CH 1	16306
116	REFL POS 14 2ND LOOK	3993	260	CH 2	16707
118	SCENE DATA BP 14 CH 1	16306	302	REFLECTOR WARM CAL POS	11961
120	CH 2	16699	304	REFL WARM CAL 2ND LOOK	11961
122	REFLECTOR POSITION 15	3834	306	WARM CAL DATA 1 CH 1	16290
124	REFL POS 15 2ND LOOK	3841	308	CH 2	16690
126	SCENE DATA BP 15 CH 1	16303	310	WARM CAL DATA 2 CH 1	16292
128	CH 2	16706	312	CH 2	16693
130	REFLECTOR POSITION 16	3685			
132	REFL POS 16 2ND LOOK	3690			
134	SCENE DATA BP 16 CH 1	16300			
136	CH 2	16709			

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	17218	21.26
264	FEED HORN	17237	21.58
266	RF MUX	17080	22.34
268	MIXER/IF AMPLIFIER CHANNEL 1	18026	22.84
270	MIXER/IF AMPLIFIER CHANNEL 2	18106	23.08
272	LOCAL OSCILLATOR CHANNEL 1	17682	22.58
274	LOCAL OSCILLATOR CHANNEL 2	18056	23.70
276	COMPENSATION MOTOR	16691	21.57
278	SUB REFLECTOR	17239	21.60
280	DC/DC CONVERTER	18839	24.61
282	RF SHELF	17643	22.12
284	DETECTOR/PREAMP ASSEMBLY	17453	22.11
286	WARM LOAD CENTER	21825	20.71
288	WARM LOAD 1	21877	20.79
290	WARM LOAD 2	21838	20.79
292	WARM LOAD 3	21904	20.78
294	WARM LOAD 4	22037	20.84
296	WARM LOAD 5	22044	20.79
298	WARM LOAD 6	21741	20.64
300	TEMP SENSOR REFERENCE VOLTAGE	25113	

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER POWER	ON	ON	ON
COMPENSATOR MOTOR POWER	ON	ON	ON
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	YES	YES	YES
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	ON	ON	ON
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
RF SHELF TEMPERATURE	213	21.6	213	21.6	213	21.6
COMPENSATOR MOTOR TEMPERATURE	213	21.3	213	21.3	213	21.3
SCANNER MOTOR TEMPERATURE	214	21.4	214	21.4	214	21.4
WARM LOAD TEMPERATURE	213	21.0	212	19.6	213	21.0

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	102	95.06	104	96.93	102	95.06
COMPENSATOR MOTOR CURRENT (AVERAGE)	103	96.00	105	97.86	103	96.00
SIGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
ANTENNA DRIVE +15 VDC	173	15.26	175	15.43	174	15.35
SIGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
ANTENNA DRIVE -15 VDC	151	-14.85	152	-14.80	151	-14.85
RECEIVER +10 VDC	171	10.06	171	10.06	171	10.06
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	146	5.04	146	5.04	146	5.04
ANTENNA DRIVE +5 VDC	148	5.06	150	5.13	149	5.10
GUNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
GUNN DIODE OSC #2 (CHANNEL 2) VDC	171	9.94	171	9.94	171	9.94

PRT TEMPERATURES	NO.	DEG K	NO.	DEG K
VARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
FIXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
BASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES	NO.	DEG K	NO.	DEG K
FIXED TARGET SHROUD	532	32.00	533	33.00
VARIABLE TARGET SHROUD	515	7.00	516	8.00
FIXED TARGET N2	502	30.00	503	31.00
VARIABLE TARGET N2	507	5.00	508	6.00
HEATER N2	505	1.00	506	2.00
FIXED TARGET FLOW METER	504	34.00		
VARIABLE TARGET FLOW METER	509	9.00		
BASEPLATE HEATER N2	510	3.00	511	4.00
BASEPLATE N2	512	36.00	513	37.00
BASEPLATE FLOW METER	514	35.00		
ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 18
Digital-A Data Output Full Scan Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.1)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	2	2	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________
SA # 073-

AMSU 7

2-19-00
Test Systems Engineer Date

2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

2/19/00 275
Quality Control

```
MSU  A2-30 A2.EXE     FULL SCAN MODE      18-FEB-00  23:57:24  SCAN NUMBER   192
 5 ] DIGITAL A DATA   ELEMENT 0000

 6 ] DIGITAL B DATA   ELEMENT   00

 7 ] ANALOG DATA      ELEMENT   00

                                     COMMANDS
[ 9 ]  MODULE POWER =           CONNECT   ANTENNA IN COLD CAL POSIT = NO   [ 15 ]

[ 10 ] SURVIVAL HEATER POWER =      OFF   ANTENNA IN NADIR POSITION = NO   [ 16 ]

[ 11 ] MODULE TOTALLY OFF =         ON    ANTENNA IN FULL SCAN MODE = YES  [ 17 ]

[ 12 ] SCANNER A2 POWER =           ON    COLD CAL POSITION MSB =    ZERO  [ 18 ]

[ 13 ] COMPENSATOR MOTOR POWER =    ON    COLD CAL POSITION LSB =    ZERO  [ 19 ]

[ 14 ] ANTENNA IN WARM CAL POSIT = NO

          POWER [ 4 ]  ON
                       SCREEN ONLY [ 2 ]  PRINT  [ 3 ] FULL       [ 1 ] RETURN
SELECT TOUCHSCREEN BUTTON 3
```

TDS # 18

FINAL CPT

A2-108

S/N # 335079

OP.# 0730

AMSU A2_30   A2.EXE   DIGITAL A DATA   18-FEB-00   23:57:28   PAGE 1

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	3531
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	3538
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16289
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16715
5	DIGITAL B DATA BYTE 1	00000010	146	REFLECTOR POSITION 18	3380
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	3387
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16295
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16719
10	REFLECTOR POSITION 1	5967	154	REFLECTOR POSITION 19	3229
12	REFL POS 1 2ND LOOK	5967	156	REFL POS 19 2ND LOOK	3234
14	SCENE DATA BP 1 CH 1	16306	158	SCENE DATA BP 19 CH 1	16296
16	CH 2	16726	160	CH 2	16721
18	REFLECTOR POSITION 2	5809	162	REFLECTOR POSITION 20	3077
20	REFL POS 2 2ND LOOK	5813	164	REFL POS 20 2ND LOOK	3082
22	SCENE DATA BP 2 CH 1	16308	166	SCENE DATA BP 20 CH 1	16301
24	CH 2	16732	168	CH 2	16720
26	REFLECTOR POSITION 3	5656	170	REFLECTOR POSITION 21	2925
28	REFL POS 3 2ND LOOK	5662	172	REFL POS 21 2ND LOOK	2932
30	SCENE DATA BP 3 CH 1	16309	174	SCENE DATA BP 21 CH 1	16305
32	CH 2	16739	176	CH 2	16720
34	REFLECTOR POSITION 4	5505	178	REFLECTOR POSITION 22	2773
36	REFL POS 4 2ND LOOK	5511	180	REFL POS 22 2ND LOOK	2779
38	SCENE DATA BP 4 CH 1	16315	182	SCENE DATA BP 22 CH 1	16300
40	CH 2	16730	184	CH 2	16718
42	REFLECTOR POSITION 5	5354	186	REFLECTOR POSITION 23	2621
44	REFL POS 5 2ND LOOK	5359	188	REFL POS 23 2ND LOOK	2627
46	SCENE DATA BP 5 CH 1	16314	190	SCENE DATA BP 23 CH 1	16293
48	CH 2	16733	192	CH 2	16714
50	REFLECTOR POSITION 6	5201	194	REFLECTOR POSITION 24	2469
52	REFL POS 6 2ND LOOK	5207	196	REFL POS 24 2ND LOOK	2476
54	SCENE DATA BP 6 CH 1	16317	198	SCENE DATA BP 24 CH 1	16294
56	CH 2	16726	200	CH 2	16716
58	REFLECTOR POSITION 7	5052	202	REFLECTOR POSITION 25	2319
60	REFL POS 7 2ND LOOK	5055	204	REFL POS 25 2ND LOOK	2324
62	SCENE DATA BP 7 CH 1	16320	206	SCENE DATA BP 25 CH 1	16304
64	CH 2	16725	208	CH 2	16721
66	REFLECTOR POSITION 8	4899	210	REFLECTOR POSITION 26	2169
68	REFL POS 8 2ND LOOK	4903	212	REFL POS 26 2ND LOOK	2174
70	SCENE DATA BP 8 CH 1	16311	214	SCENE DATA BP 26 CH 1	16313
72	CH 2	16723	216	CH 2	16724
74	REFLECTOR POSITION 9	4746	218	REFLECTOR POSITION 27	2015
76	REFL POS 9 2ND LOOK	4752	220	REFL POS 27 2ND LOOK	2022
78	SCENE DATA BP 9 CH 1	16312	222	SCENE DATA BP 27 CH 1	16306
80	CH 2	16728	224	CH 2	16730
82	REFLECTOR POSITION 10	4595	226	REFLECTOR POSITION 28	1864
84	REFL POS 10 2ND LOOK	4600	228	REFL POS 28 2ND LOOK	1869
86	SCENE DATA BP 10 CH 1	16309	230	SCENE DATA BP 28 CH 1	16310
88	CH 2	16719	232	CH 2	16725
90	REFLECTOR POSITION 11	4443	234	REFLECTOR POSITION 29	1713
92	REFL POS 11 2ND LOOK	4448	236	REFL POS 29 2ND LOOK	1719

LEMENT	DESCRIPTION			VALUE
94	SCENE DATA BP 11	CH	1	16334
96		CH	2	16734
98	REFLECTOR POSITION 12			4290
100	REFL POS 12 2ND LOOK			4297
102	SCENE DATA BP 12	CH	1	16319
104		CH	2	16731
106	REFLECTOR POSITION 13			4141
108	REFL POS 13 2ND LOOK			4146
110	SCENE DATA BP 13	CH	1	16307
112		CH	2	16724
114	REFLECTOR POSITION 14			3987
116	REFL POS 14 2ND LOOK			3992
118	SCENE DATA BP 14	CH	1	16306
120		CH	2	16722
122	REFLECTOR POSITION 15			3834
124	REFL POS 15 2ND LOOK			3841
126	SCENE DATA BP 15	CH	1	16301
128		CH	2	16721
130	REFLECTOR POSITION 16			3685
132	REFL POS 16 2ND LOOK			3690
134	SCENE DATA BP 16	CH	1	16297
136		CH	2	16719

ELEMENT	DESCRIPTION			VALUE
238	SCENE DATA BP 29	CH	1	16309
240		CH	2	16728
242	REFLECTOR POSITION 30			1560
244	REFL POS 30 2ND LOOK			1566
246	SCENE DATA BP 30	CH	1	16304
248		CH	2	16726
250	REFLECTOR COLD CAL POS			16357
252	REFL COLD CAL 2ND LOOK			16358
254	COLD CAL DATA 1	CH	1	16296
256		CH	2	16721
258	COLD CAL DATA 2	CH	1	16295
260		CH	2	16721
302	REFLECTOR WARM CAL POS			11961
304	REFL WARM CAL 2ND LOOK			11960
306	WARM CAL DATA 1	CH	1	16299
308		CH	2	16729
310	WARM CAL DATA 2	CH	1	16297
312		CH	2	16727

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	17870	22.49
264	FEED HORN	17679	22.42
266	RF MUX	17548	23.23
268	MIXER/IF AMPLIFIER CHANNEL 1	18503	23.75
270	MIXER/IF AMPLIFIER CHANNEL 2	18545	23.92
272	LOCAL OSCILLATOR CHANNEL 1	18172	23.50
274	LOCAL OSCILLATOR CHANNEL 2	18471	24.49
276	COMPENSATION MOTOR	17267	22.66
278	SUB REFLECTOR	17775	22.61
280	DC/DC CONVERTER	19091	25.09
282	RF SHELF	18116	23.01
284	DETECTOR/PREAMP ASSEMBLY	17929	23.01
286	WARM LOAD CENTER	22689	22.40
288	WARM LOAD 1	22715	22.43
290	WARM LOAD 2	22688	22.46
292	WARM LOAD 3	22770	22.47
294	WARM LOAD 4	22879	22.48
296	WARM LOAD 5	22921	22.50
298	WARM LOAD 6	22617	22.36
300	TEMP SENSOR REFERENCE VOLTAGE	25114	

DESCRIPTION	STATUS	STATUS	STATUS
'ANNER POWER	ON	ON	ON
'MPENSATOR MOTOR POWER	ON	ON	ON
'TENNA IN WARM CAL POSITION MODE	NO	NO	NO
'TENNA IN COLD CAL POSITION MODE	NO	NO	NO
'TENNA IN NADIR POSITION MODE	NO	NO	NO
'TENNA IN FULL SCAN MODE	YES	YES	YES
'RVIVAL HEATER POWER	OFF	OFF	OFF
)DULE POWER	ON	ON	ON
)LD CAL POSITION MSB	ZERO	ZERO	ZERO
)LD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
F SHELF TEMPERATURE	214	23.0	214	23.0	214	23.0
OMPENSATOR MOTOR TEMPERATURE	213	21.3	213	21.3	213	21.3
CANNER MOTOR TEMPERATURE	214	21.4	214	21.4	214	21.4
ARM LOAD TEMPERATURE	214	22.4	214	22.4	214	22.4

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
NTENNA DRIVE MOTOR CURRENT (AVERAGE)	56	52.19	61	56.85	69	64.31
OMPENSATOR MOTOR CURRENT (AVERAGE)	55	51.26	60	55.92	69	64.31
IGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
NTENNA DRIVE +15 VDC	174	15.35	173	15.26	175	15.43
IGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
NTENNA DRIVE -15 VDC	152	-14.80	151	-14.85	153	-14.75
ECEIVER +10 VDC	171	10.06	171	10.06	171	10.06
ADIOMETER, RECEIVER, PROCESSOR +5 VDC	145	5.00	145	5.00	145	5.00
NTENNA DRIVE +5 VDC	149	5.10	149	5.10	150	5.13
UNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
UNN DIODE OSC #2 (CHANNEL 2) VDC	172	10.00	172	10.00	172	10.00

PRT TEMPERATURES

	NO.	DEG K	NO.	DEG K
VARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
FIXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
BASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES

	NO.	DEG K	NO.	DEG K
FIXED TARGET SHROUD	532	32.00	533	33.00
VARIABLE TARGET SHROUD	515	7.00	516	8.00
FIXED TARGET N2	502	30.00	503	31.00
VARIABLE TARGET N2	507	5.00	508	6.00
HEATER N2	505	1.00	506	2.00
FIXED TARGET FLOW METER	504	34.00		
VARIABLE TARGET FLOW METER	509	9.00		
BASEPLATE HEATER N2	510	3.00	511	4.00
BASEPLATE N2	512	36.00	513	37.00
BASEPLATE FLOW METER	514	35.00		
ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 19
Reflector Positions Section [IV] (Paragraph 3.2.4.3.4.1)

BP	A2 Reflector		
	Position*	Required**	Pass/Fail
01	5967	5962	PASS
02	5814	5810	
03	5661	5658	
04	5510	5507	
05	5358	5355	
06	5207	5203	
07	5055	5052	
08	4904	4900	
09	4752	4748	
10	4600	4597	
11	4448	4445	
12	4287	4293	
13	4146	4142	
14	3993	3990	
15	3841	3838	
16	3690	3687	
17	3538	3535	
18	3387	3383	
19	3234	3232	
20	3082	3080	
21	2932	2928	
22	2779	2777	
23	2627	2625	
24	2476	2473	
25	2319	2322	
26	2168	2170	
27	2015	2018	
28	1863	1867	
29	1713	1715	
30	1561	1563	
CC	16357	16354	
WC	11961	11955	PASS

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position data from TDS 6 of AE-26002/2 ±5 counts.

OP. #0730

METSAT/AMSU A2 System CPT ~~P/N~~ IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 BEIT

2-19-00

Test Systems Engineer Date

7A 194 2-20-00

Quality Control

2-20-00

Customer Representative Date

Date

(Flight Hardware Only)

MSU A2-30 A2.EXE FULL SCAN MODE 18-FEB-00 23:59:44 SCAN NUMBER 209

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

P	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5967	5967	9	4746	4752	17	3532	3538	25	2319	2324
2	5809	5814	10	4596	4600	18	3379	3387	26	2168	2174
3	5656	5661	11	4442	4448	19	3229	3234	27	2015	2022
4	5506	5510	12	4291	4297	20	3076	3082	28	1863	1869
5	5354	5359	13	4141	4146	21	2926	2932	29	1713	1719
6	5201	5207	14	3987	3993	22	2773	2779	30	1561	1567
7	5052	5055	15	3834	3841	23	2622	2627	CC	16357	16358
8	4898	4904	16	3684	3690	24	2468	2476	WC	11961	11960

POWER [4] ON

SELECT_TOUCHSCREEN_BUTTON 2 SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

TDS # 19

A2-108

FINAL CPT

S/N # 335479

OP # 0730

TEST DATA SHEET 20

Digital-A Data Output Radiometer Data Section [V] (Paragraph 3.2.4.3.4.1)

BP	Channel-1 (23.8 GHz)			Channel-2 (31.4 GHz)		
	Measured*	Required**	Pass/Fail	Measured*	Required**	Pass/Fail
01	16303	16500	PASS	16725	16500	PASS
02	16303	16500		16729	16500	
03	16304	16500		16730	16500	
04	16306	16500		16729	16500	
05	16307	16500		16728	16500	
06	16312	16500		16718	16500	
07	16308	16500		16724	16500	
08	16299	16500		16715	16500	
09	16305	16500		16721	16500	
10	16299	16500		16720	16500	
11	16323	16500		16736	16500	
12	16309	16500		16732	16500	
13	16297	16500		16724	16500	
14	16295	16500		16716	16500	
15	16291	16500		16712	16500	
16	16292	16500		16710	16500	
17	16288	16500		16707	16500	
18	16289	16500		16716	16500	
19	16290	16500		16709	16500	
20	16295	16500		16717	16500	
21	16291	16500		16714	16500	
22	16294	16500		16717	16500	
23	16284	16500		16711	16500	
24	16295	16500		16713	16500	
25	16297	16500		16715	16500	
26	16299	16500		16722	16500	
27	16297	16500		16733	16500	
28	16301	16500		16726	16500	
29	16295	16500		16726	16500	
30	16298	16500		16718	16500	
CC	16285	16500		16712	16500	
WC	16290	16500	PASS	16720	16500	PASS

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required = 16,500 ± 4000 counts.

OP# 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ______

AMSU 7 SEIT 2-19-00

Test Systems Engineer Date

Anita Navarro 2/19/00 QA 275

Quality Control

R. Drum 2-19-00

Customer Representative Date

Date

(Flight Hardware Only)

3U A2-30 A2.EXE FULL SCAN MODE 19-FEB-00 0υ:01:36 SCAN NUMBER 223

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 1

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16303	9	16305	17	16288	25	16297
2	16303	10	16299	18	16289	26	16299
3	16304	11	16323	19	16290	27	16297
4	16306	12	16309	20	16295	28	16301
5	16307	13	16297	21	16291	29	16295
6	16312	14	16295	22	16294	30	16298
7	16308	15	16291	23	16284	CC	16285
8	16299	16	16292	24	16295	WC	16290

21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN
SELECT_TOUCHSCREEN_BUTTON 2

TDS # 20
A2-108
FINAL CPT
S/N# 335078
OP# 0730

A2-30 A2.EXE FULL SCAN MODE 19-FEB-00 0υ:01:43 SCAN NUMBER 224

] DIGITAL A DATA ELEMENT 0000

] DIGITAL B DATA ELEMENT 00

] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 2

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16725	9	16721	17	16707	25	16715
2	16729	10	16720	18	16716	26	16722
3	16730	11	16736	19	16709	27	16733
4	16724	12	16732	20	16717	28	16726
5	16728	13	16724	21	16714	29	16726
6	16718	14	16716	22	16717	30	16718
7	16724	15	16712	23	16711	CC	16712
8	16715	16	16710	24	16713	WC	16720

21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

ELECT TOUCHSCREEN BUTTON 2

TEST DATA SHEET 21
Full Scan Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.1)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor	22.54	25 ± 15	PASS
0264	Feedhorn	22.50	25 ± 15	
0266	RF Mux	23.38	25 ± 15	
0268	Mixer I.F. Amp. Channel 1	23.93	25 ± 15	
0270	Mixer I.F. Amp. Channel 2	24.13	25 ± 15	
0272	Local Oscillator Channel 1	23.67	25 ± 15	
0274	Local Oscillator Channel 2	24.77	25 ± 15	
0276	Compensation Motor	22.75	25 ± 15	
0278	Subreflector	22.63	25 ± 15	
0280	DC/DC Converter	25.55	25 ± 15	
0282	RF Shelf	23.16	25 ± 15	
0284	Detector/Preamp Assembly	23.18	25 ± 15	
0286	Warm Load Center	22.41	25 ± 15	
0288	Warm Load 1	22.49	25 ± 15	
0290	Warm Load 2	22.46	25 ± 15	
0292	Warm Load 3	22.46	25 ± 15	
0294	Warm Load 4	22.53	25 ± 15	
0296	Warm Load 5	22.47	25 ± 15	
0298	Warm Load 6	22.32	25 ± 15	
0300	Temp Sensor V. Reference	25115	**	PASS

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

op# 5730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

2-19-00
Test Systems Engineer Date

R. [signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

Anita [signature] 2/19/00
Quality Control

AMSU 7 QC

74 275

;U A2-30 A2.EXE FULL SCAN MODE 19-FEB-00 0U:02:06 SCAN NUMBER 227

;] DIGITAL A DATA ELEMENT 0000

5] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES

	DATA	TEMP C	NO		DATA	TEMP C
SCAN MOTOR	17897	22.54	11	RF SHELF	18195	23.16
FEED HORN	17720	22.50	12	DET/PREAMP	18020	23.18
RF MUX	17632	23.38	13	WARM LOAD CNTR	22692	22.41
MIXER IF CH 1	18601	23.93	14	WARM LOAD 1	22748	22.49
MIXER IF CH 2	18655	24.13	15	WARM LOAD 2	22690	22.46
LO CHANNEL 1	18264	23.67	16	WARM LOAD 3	22763	22.46
LO CHANNEL 2	18618	24.77	17	WARM LOAD 4	22905	22.53
COMP MOTOR	17315	22.75	18	WARM LOAD 5	22907	22.47
SUBREFLECTOR	17786	22.63	19	WARM LOAD 6	22599	22.32
DC/DC CONVERTER	19334	25.55		THERMAL REFERENCE	25115	

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TDS # 21
A2-108
FINAL CAT
S/N # 335079
OP # 0730

TEST DATA SHEET 22
Digital-A Data Output Warm Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.2)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	4	4	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________
OP. 0733

AMSU 7 SEIT

2-19-00
Test Systems Engineer Date

Anita Navarro 2/19/00 QA 275
Quality Control

[signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

MSU A2-30 A2.EXE WARM CAL MODE 19-FEB-00 01:42:17 SCAN NUMBER 15

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

COMMANDS

9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POSIT =	NO	[15]
10] SURVIVAL HEATER POWER =	OFF	ANTENNA IN NADIR POSITION =	NO	[16]
11] MODULE TOTALLY OFF =	ON	ANTENNA IN FULL SCAN MODE =	NO	[17]
12] SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
13] COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
14] ANTENNA IN WARM CAL POSIT =	YES			

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 3

TDS # 22
A2-108
FINAL CPT
S/# 335079
sp.# 0730

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	11961
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	11961
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16362
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16808
5	DIGITAL B DATA BYTE 1	00000100	146	REFLECTOR POSITION 18	11961
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	11961
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16361
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16810
10	REFLECTOR POSITION 1	11961	154	REFLECTOR POSITION 19	11961
12	REFL POS 1 2ND LOOK	11961	156	REFL POS 19 2ND LOOK	11961
14	SCENE DATA BP 1 CH 1	16368	158	SCENE DATA BP 19 CH 1	16363
16	CH 2	16811	160	CH 2	16808
18	REFLECTOR POSITION 2	11961	162	REFLECTOR POSITION 20	11961
20	REFL POS 2 2ND LOOK	11961	164	REFL POS 20 2ND LOOK	11961
22	SCENE DATA BP 2 CH 1	16361	166	SCENE DATA BP 20 CH 1	16357
24	CH 2	16814	168	CH 2	16811
26	REFLECTOR POSITION 3	11961	170	REFLECTOR POSITION 21	11961
28	REFL POS 3 2ND LOOK	11961	172	REFL POS 21 2ND LOOK	11961
30	SCENE DATA BP 3 CH 1	16367	174	SCENE DATA BP 21 CH 1	16362
32	CH 2	16813	176	CH 2	16809
34	REFLECTOR POSITION 4	11961	178	REFLECTOR POSITION 22	11961
36	REFL POS 4 2ND LOOK	11961	180	REFL POS 22 2ND LOOK	11961
38	SCENE DATA BP 4 CH 1	16367	182	SCENE DATA BP 22 CH 1	16361
40	CH 2	16814	184	CH 2	16809
42	REFLECTOR POSITION 5	11961	186	REFLECTOR POSITION 23	11961
44	REFL POS 5 2ND LOOK	11961	188	REFL POS 23 2ND LOOK	11961
46	SCENE DATA BP 5 CH 1	16366	190	SCENE DATA BP 23 CH 1	16363
48	CH 2	16815	192	CH 2	16808
50	REFLECTOR POSITION 6	11961	194	REFLECTOR POSITION 24	11961
52	REFL POS 6 2ND LOOK	11961	196	REFL POS 24 2ND LOOK	11961
54	SCENE DATA BP 6 CH 1	16365	198	SCENE DATA BP 24 CH 1	16361
56	CH 2	16815	200	CH 2	16810
58	REFLECTOR POSITION 7	11961	202	REFLECTOR POSITION 25	11961
60	REFL POS 7 2ND LOOK	11961	204	REFL POS 25 2ND LOOK	11961
62	SCENE DATA BP 7 CH 1	16364	206	SCENE DATA BP 25 CH 1	16355
64	CH 2	16811	208	CH 2	16807
66	REFLECTOR POSITION 8	11961	210	REFLECTOR POSITION 26	11961
68	REFL POS 8 2ND LOOK	11961	212	REFL POS 26 2ND LOOK	11961
70	SCENE DATA BP 8 CH 1	16364	214	SCENE DATA BP 26 CH 1	16357
72	CH 2	16806	216	CH 2	16806
74	REFLECTOR POSITION 9	11961	218	REFLECTOR POSITION 27	11961
76	REFL POS 9 2ND LOOK	11961	220	REFL POS 27 2ND LOOK	11961
78	SCENE DATA BP 9 CH 1	16364	222	SCENE DATA BP 27 CH 1	16356
80	CH 2	16806	224	CH 2	16812
82	REFLECTOR POSITION 10	11961	226	REFLECTOR POSITION 28	11961
84	REFL POS 10 2ND LOOK	11961	228	REFL POS 28 2ND LOOK	11961
86	SCENE DATA BP 10 CH 1	16360	230	SCENE DATA BP 28 CH 1	16358
88	CH 2	16809	232	CH 2	16810
90	REFLECTOR POSITION 11	11961	234	REFLECTOR POSITION 29	11961
92	REFL POS 11 2ND LOOK	11961	236	REFL POS 29 2ND LOOK	11961

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	SCENE DATA BP 11 CH 1	16362	238	SCENE DATA BP 29 CH 1	16358
96	CH 2	16810	240	CH 2	16805
98	REFLECTOR POSITION 12	11961	242	REFLECTOR POSITION 30	11961
100	REFL POS 12 2ND LOOK	11961	244	REFL POS 30 2ND LOOK	11961
102	SCENE DATA BP 12 CH 1	16361	246	SCENE DATA BP 30 CH 1	16358
104	CH 2	16810	248	CH 2	16804
106	REFLECTOR POSITION 13	11961	250	REFLECTOR COLD CAL POS	0E
108	REFL POS 13 2ND LOOK	11961	252	REFL COLD CAL 2ND LOOK	0E
110	SCENE DATA BP 13 CH 1	16361	254	COLD CAL DATA 1 CH 1	0
112	CH 2	16810	256	CH 2	0
114	REFLECTOR POSITION 14	11961	258	COLD CAL DATA 2 CH 1	0
116	REFL POS 14 2ND LOOK	11961	260	CH 2	0
118	SCENE DATA BP 14 CH 1	16358	302	REFLECTOR WARM CAL POS	0E
120	CH 2	16812	304	REFL WARM CAL 2ND LOOK	0E
122	REFLECTOR POSITION 15	11961	306	WARM CAL DATA 1 CH 1	0
124	REFL POS 15 2ND LOOK	11961	308	CH 2	0
126	SCENE DATA BP 15 CH 1	16358	310	WARM CAL DATA 2 CH 1	0
128	CH 2	16813	312	CH 2	0
130	REFLECTOR POSITION 16	11961			
132	REFL POS 16 2ND LOOK	11961			
134	SCENE DATA BP 16 CH 1	16364			
136	CH 2	16813			

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	18123	22.97
264	FEED HORN	18024	23.07
266	RF MUX	18020	24.12
268	MIXER/IF AMPLIFIER CHANNEL 1	18794	24.30
270	MIXER/IF AMPLIFIER CHANNEL 2	18766	24.34
272	LOCAL OSCILLATOR CHANNEL 1	18539	24.20
274	LOCAL OSCILLATOR CHANNEL 2	18594	24.72
276	COMPENSATION MOTOR	17566	23.22
278	SUB REFLECTOR	17965	22.97
280	DC/DC CONVERTER	19097	25.10
282	RF SHELF	18635	23.99
284	DETECTOR/PREAMP ASSEMBLY	18509	24.11
286	WARM LOAD CENTER	23100	23.21
288	WARM LOAD 1	23125	23.24
290	WARM LOAD 2	23097	23.26
292	WARM LOAD 3	23187	23.30
294	WARM LOAD 4	23297	23.30
296	WARM LOAD 5	23316	23.28
298	WARM LOAD 6	23026	23.17
300	TEMP SENSOR REFERENCE VOLTAGE	25114	

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER POWER	ON	ON	ON
COMPENSATOR MOTOR POWER	ON	ON	ON
ANTENNA IN WARM CAL POSITION MODE	YES	YES	YES
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	NO	NO	NO
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	ON	ON	ON
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
RF SHELF TEMPERATURE	186	-15.8	191	-8.8	195	-3.3
COMPENSATOR MOTOR TEMPERATURE	185	-17.4	190	-10.5	194	-4.9
SCANNER MOTOR TEMPERATURE	186	-17.1	190	-11.6	194	-6.1
WARM LOAD TEMPERATURE	186	-16.3	191	-9.4	195	-3.9

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
COMPENSATOR MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
SIGNAL PROCESSING +15 VDC	142	12.58	147	13.02	151	13.36
ANTENNA DRIVE +15 VDC	142	12.58	147	13.02	151	13.36
SIGNAL PROCESSING -15 VDC	124	-16.20	128	-16.00	131	-15.85
ANTENNA DRIVE -15 VDC	124	-16.20	128	-16.00	131	-15.85
RECEIVER +10 VDC	143	8.44	147	8.67	151	8.90
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	124	4.30	128	4.44	131	4.54
ANTENNA DRIVE +5 VDC	122	4.20	126	4.33	129	4.43
GUNN DIODE OSC #1 (CHANNEL 1) VDC	144	8.40	149	8.69	152	8.86
GUNN DIODE OSC #2 (CHANNEL 2) VDC	145	8.46	149	8.69	153	8.91

PRT TEMPERATURES

	NO.	DEG K	NO.	DEG K
VARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
FIXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
BASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES

	NO.	DEG K	NO.	DEG K
FIXED TARGET SHROUD	532	32.00	533	33.00
VARIABLE TARGET SHROUD	515	7.00	516	8.00
FIXED TARGET N2	502	30.00	503	31.00
VARIABLE TARGET N2	507	5.00	508	6.00
HEATER N2	505	1.00	506	2.00
FIXED TARGET FLOW METER	504	34.00		
VARIABLE TARGET FLOW METER	509	9.00		
BASEPLATE HEATER N2	510	3.00	511	4.00
BASEPLATE N2	512	36.00	513	37.00
BASEPLATE FLOW METER	514	35.00		
ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 22
Digital-A Data Output Warm Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.2)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	4	4	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

Amend *1 Oper. 8050

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

Ken Shane AMSU 6 SEIT 2-24-00
Test Systems Engineer Date

J. Sanford 2-25-00
Customer Representative Date
Date
(Flight Hardware Only)

A 269 25 FEB 00
Quality Control

```
AMSU  A2-30 A2.EXE     WARM CAL MODE        24-FEB-00  20:20:23  SCAN NUMBER   371
[ 5 ] DIGITAL A DATA   ELEMENT 0000
[ 6 ] DIGITAL B DATA   ELEMENT   00
[ 7 ] ANALOG DATA      ELEMENT   00

                                    COMMANDS
[ 9 ]  MODULE POWER =           CONNECT   ANTENNA IN COLD CAL POSIT = NO   [ 15 ]
[ 10 ] SURVIVAL HEATER POWER =      OFF   ANTENNA IN NADIR POSITION = NO   [ 16 ]
[ 11 ] MODULE TOTALLY OFF =         ON    ANTENNA IN FULL SCAN MODE = NO   [ 17 ]
[ 12 ] SCANNER A2 POWER =           ON    COLD CAL POSITION MSB =    ZERO  [ 18 ]
[ 13 ] COMPENSATOR MOTOR POWER =    ON    COLD CAL POSITION LSB =    ZERO  [ 19 ]
[ 14 ] ANTENNA IN WARM CAL POSIT = YES
        POWER [ 4 ]  ON
                     SCREEN ONLY [ 2 ]  PRINT  [ 3 ] FULL      [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 3
```

Test data in support of TDS 22
S/O 335079 Amend #1 Oper 8050
TP 3.2.4.3.4.2

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	11960
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	11960
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16264
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16676
5	DIGITAL B DATA BYTE 1	00000100	146	REFLECTOR POSITION 18	11960
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	11960
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16266
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16677
10	REFLECTOR POSITION 1	11960	154	REFLECTOR POSITION 19	11960
12	REFL POS 1 2ND LOOK	11960	156	REFL POS 19 2ND LOOK	11960
14	SCENE DATA BP 1 CH 1	16269	158	SCENE DATA BP 19 CH 1	16266
16	CH 2	16684	160	CH 2	16684
18	REFLECTOR POSITION 2	11960	162	REFLECTOR POSITION 20	11960
20	REFL POS 2 2ND LOOK	11960	164	REFL POS 20 2ND LOOK	11960
22	SCENE DATA BP 2 CH 1	16262	166	SCENE DATA BP 20 CH 1	16265
24	CH 2	16677	168	CH 2	16680
26	REFLECTOR POSITION 3	11960	170	REFLECTOR POSITION 21	11960
28	REFL POS 3 2ND LOOK	11960	172	REFL POS 21 2ND LOOK	11960
30	SCENE DATA BP 3 CH 1	16265	174	SCENE DATA BP 21 CH 1	16268
32	CH 2	16677	176	CH 2	16678
34	REFLECTOR POSITION 4	11960	178	REFLECTOR POSITION 22	11960
36	REFL POS 4 2ND LOOK	11960	180	REFL POS 22 2ND LOOK	11960
38	SCENE DATA BP 4 CH 1	16264	182	SCENE DATA BP 22 CH 1	16269
40	CH 2	16682	184	CH 2	16682
42	REFLECTOR POSITION 5	11960	186	REFLECTOR POSITION 23	11960
44	REFL POS 5 2ND LOOK	11960	188	REFL POS 23 2ND LOOK	11960
46	SCENE DATA BP 5 CH 1	16265	190	SCENE DATA BP 23 CH 1	16265
48	CH 2	16679	192	CH 2	16681
50	REFLECTOR POSITION 6	11960	194	REFLECTOR POSITION 24	11960
52	REFL POS 6 2ND LOOK	11960	196	REFL POS 24 2ND LOOK	11960
54	SCENE DATA BP 6 CH 1	16271	198	SCENE DATA BP 24 CH 1	16266
56	CH 2	16677	200	CH 2	16679
58	REFLECTOR POSITION 7	11960	202	REFLECTOR POSITION 25	11960
60	REFL POS 7 2ND LOOK	11960	204	REFL POS 25 2ND LOOK	11960
62	SCENE DATA BP 7 CH 1	16265	206	SCENE DATA BP 25 CH 1	16264
64	CH 2	16682	208	CH 2	16683
66	REFLECTOR POSITION 8	11960	210	REFLECTOR POSITION 26	11960
68	REFL POS 8 2ND LOOK	11960	212	REFL POS 26 2ND LOOK	11960
70	SCENE DATA BP 8 CH 1	16271	214	SCENE DATA BP 26 CH 1	16267
72	CH 2	16681	216	CH 2	16677
74	REFLECTOR POSITION 9	11960	218	REFLECTOR POSITION 27	11960
76	REFL POS 9 2ND LOOK	11960	220	REFL POS 27 2ND LOOK	11960
78	SCENE DATA BP 9 CH 1	16267	222	SCENE DATA BP 27 CH 1	16268
80	CH 2	16681	224	CH 2	16676
82	REFLECTOR POSITION 10	11960	226	REFLECTOR POSITION 28	11960
84	REFL POS 10 2ND LOOK	11960	228	REFL POS 28 2ND LOOK	11960
86	SCENE DATA BP 10 CH 1	16267	230	SCENE DATA BP 28 CH 1	16265
88	CH 2	16679	232	CH 2	16682
90	REFLECTOR POSITION 11	11960	234	REFLECTOR POSITION 29	11960
92	REFL POS 11 2ND LOOK	11960	236	REFL POS 29 2ND LOOK	11960

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	SCENE DATA BP 11 CH 1	16267	238	SCENE DATA BP 29 CH 1	16267
96	CH 2	16679	240	CH 2	16676
98	REFLECTOR POSITION 12	11960	242	REFLECTOR POSITION 30	11960
100	REFL POS 12 2ND LOOK	11960	244	REFL POS 30 2ND LOOK	11960
102	SCENE DATA BP 12 CH 1	16266	246	SCENE DATA BP 30 CH 1	16263
104	CH 2	16681	248	CH 2	16677
106	REFLECTOR POSITION 13	11960	250	REFLECTOR COLD CAL POS	0E
108	REFL POS 13 2ND LOOK	11960	252	REFL COLD CAL 2ND LOOK	0E
110	SCENE DATA BP 13 CH 1	16266	254	COLD CAL DATA 1 CH 1	0
112	CH 2	16684	256	CH 2	0
114	REFLECTOR POSITION 14	11960	258	COLD CAL DATA 2 CH 1	0
116	REFL POS 14 2ND LOOK	11960	260	CH 2	0
118	SCENE DATA BP 14 CH 1	16267	302	REFLECTOR WARM CAL POS	0E
120	CH 2	16681	304	REFL WARM CAL 2ND LOOK	0E
122	REFLECTOR POSITION 15	11960	306	WARM CAL DATA 1 CH 1	0
124	REFL POS 15 2ND LOOK	11960	308	CH 2	0
126	SCENE DATA BP 15 CH 1	16262	310	WARM CAL DATA 2 CH 1	0
128	CH 2	16685	312	CH 2	0
130	REFLECTOR POSITION 16	11960			
132	REFL POS 16 2ND LOOK	11960			
134	SCENE DATA BP 16 CH 1	16265			
136	CH 2	16679			

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	17370	21.54
264	FEED HORN	17458	22.00
266	RF MUX	17466	23.07
268	MIXER/IF AMPLIFIER CHANNEL 1	18472	23.69
270	MIXER/IF AMPLIFIER CHANNEL 2	18516	23.86
272	LOCAL OSCILLATOR CHANNEL 1	18119	23.40
274	LOCAL OSCILLATOR CHANNEL 2	18542	24.62
276	COMPENSATION MOTOR	16832	21.84
278	SUB REFLECTOR	17440	21.98
280	DC/DC CONVERTER	19375	25.63
282	RF SHELF	18033	22.85
284	DETECTOR/PREAMP ASSEMBLY	17892	22.94
286	WARM LOAD CENTER	22012	21.08
288	WARM LOAD 1	22063	21.15
290	WARM LOAD 2	22015	21.14
292	WARM LOAD 3	22107	21.18
294	WARM LOAD 4	22216	21.19
296	WARM LOAD 5	22241	21.17
298	WARM LOAD 6	21956	21.06
300	TEMP SENSOR REFERENCE VOLTAGE	25115	

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER POWER	ON	ON	ON
COMPENSATOR MOTOR POWER	ON	ON	ON
ANTENNA IN WARM CAL POSITION MODE	YES	YES	YES
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	NO	NO	NO
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	ON	ON	ON
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
RF SHELF TEMPERATURE	214	23.0	214	23.0	214	23.0
COMPENSATOR MOTOR TEMPERATURE	213	21.3	213	21.3	213	21.3
SCANNER MOTOR TEMPERATURE	213	20.0	213	20.0	213	20.0
WARM LOAD TEMPERATURE	213	21.0	213	21.0	213	21.0

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
COMPENSATOR MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
SIGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
ANTENNA DRIVE +15 VDC	170	15.00	169	14.91	170	15.00
SIGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
ANTENNA DRIVE -15 VDC	148	-15.00	148	-15.00	148	-15.00
RECEIVER +10 VDC	171	10.06	171	10.06	171	10.06
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	146	5.04	146	5.04	145	5.00
ANTENNA DRIVE +5 VDC	145	4.96	145	4.96	145	4.96
GUNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
GUNN DIODE OSC #2 (CHANNEL 2) VDC	172	10.00	172	10.00	172	10.00

PRT TEMPERATURES

	NO.	DEG K	NO.	DEG K
VARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
FIXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
BASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES

	NO.	DEG K	NO.	DEG K
FIXED TARGET SHROUD	532	32.00	533	33.00
VARIABLE TARGET SHROUD	515	7.00	516	8.00
FIXED TARGET N2	502	30.00	503	31.00
VARIABLE TARGET N2	507	5.00	508	6.00
HEATER N2	505	1.00	506	2.00
FIXED TARGET FLOW METER	504	34.00		
VARIABLE TARGET FLOW METER	509	9.00		
BASEPLATE HEATER N2	510	3.00	511	4.00
BASEPLATE N2	512	36.00	513	37.00
BASEPLATE FLOW METER	514	35.00		

ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 23

Reflector Position Warm Cal Mode Section [IV], Reflector Position Cold Cal Mode Section [IV], Reflector Position Nadir Mode Section [IV] (Paragraphs 3.2.4.3.4.2, 3.2.4.3.4.3, 3.2.4.3.4.4)

BP	Reflector			
	Para No.	Position*	Required**	Pass/Fail
WC	3.2.4.3.4.2, Step 5	11959	11955	PASS
CC	3.2.4.3.4.3, Step 5			
	a.	16358	16354	PASS
	b.	51	46	PASS
	c.	125	122	PASS
	d.	277	273	PASS
15	3.2.4.3.4.4, Step 5	3841	3838	PASS

WC = Warm Load
CC = Cold Load
15 = Nadir Position

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required position data from TDS 6 of AE-26002/2 ±5 counts.

3.2.4.3.4.3, Step 5 Substep	MSB	LSB
a.	0	0
b.	0	1
c.	1	0
d.	1	1

op. 40730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

Test Systems Engineer 2-20-00 Date

Quality Control 7A 194 2-20-00

Customer Representative 2-20-00 Date
Date
(Flight Hardware Only)

AMSU A2-30 A2.EXE FULL SCAN MODE 20-FEB-00 13:12:35 SCAN NUMBER 2688

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5967	5967	9	4746	4752	17	3531	3538	25	2319	2324
2	5810	5813	10	4595	4600	18	3380	3387	26	2168	2174
3	5656	5662	11	4443	4448	19	3229	3234	27	2015	2022
4	5506	5511	12	4290	4297	20	3077	3082	28	1864	1869
5	5355	5359	13	4140	4146	21	2926	2932	29	1714	1719
6	5201	5207	14	3987	3993	22	2773	2779	30	1561	1567
7	5052	5055	15	3834	3841	23	2622	2627	CC	16357	16358
8	4898	4903	16	3683	3690	24	2469	2476	WC	11961	11960

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

a.

MSB LSB
0 0

MSU A2-30 A2.EXE FULL SCAN MODE 20-FEB-00 13:30:27 SCAN NUMBER 2812

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5967	5967	9	4745	4752	17	3532	3538	25	2319	2324
2	5810	5814	10	4595	4600	18	3380	3387	26	2168	2174
3	5656	5662	11	4443	4448	19	3229	3234	27	2015	2022
4	5506	5511	12	4290	4297	20	3076	3082	28	1864	1869
5	5355	5359	13	4141	4145	21	2926	2932	29	1714	1719
6	5200	5207	14	3987	3992	22	2773	2779	30	1560	1567
7	5051	5056	15	3834	3841	23	2621	2627	CC	51	51
8	4898	4904	16	3685	3690	24	2469	2476	WC	11961	11960

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

bo

MSB LSB
0 1

MSU A2-30 A2.EXE FULL SCAN MODE 20-FEB-00 13:14:18 SCAN NUMBER 2699

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5969	5969	9	4746	4752	17	3531	3538	25	2319	2324
2	5809	5814	10	4595	4600	18	3380	3387	26	2168	2174
3	5657	5661	11	4443	4448	19	3228	3234	27	2015	2022
4	5506	5510	12	4290	4297	20	3077	3082	28	1864	1869
5	5355	5359	13	4140	4145	21	2926	2932	29	1714	1719
6	5201	5207	14	3987	3993	22	2773	2779	30	1561	1566
7	5052	5055	15	3834	3841	23	2622	2627	CC	126	125
8	4899	4904	16	3684	3690	24	2469	2476	WC	8123E	8346

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON2

C.

MSB LSB

1 0

MSU A2-30 A2.EXE FULL SCAN MODE 20-FEB-00 13:19:23 SCAN NUMBER 2733

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

P	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5967	5967	9	4745	4752	17	3531	3537	25	2319	2324
2	5809	5814	10	4595	4600	18	3380	3387	26	2168	2174
3	5656	5661	11	4443	4448	19	3229	3234	27	2015	2022
4	5506	5510	12	4291	4297	20	3076	3082	28	1864	1869
5	5355	5359	13	4141	4145	21	2925	2932	29	1713	1719
6	5200	5207	14	3987	3993	22	2774	2779	30	1560	1567
7	5051	5056	15	3834	3841	23	2622	2627	CC	277	277
8	4899	4903	16	3685	3690	24	2469	2476	WC	11959	11959

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

do.

MSB LSB

/ /

ᴍSU A2-30 A2.EXE FULL SCAN MODE 20-FEB-00 13:35:41 SCAN NUMBER 2849

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

REFLECTOR POSITIONS

P	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2	BP	LOOK 1	LOOK 2
1	5967	5967	9	4746	4752	17	3531	3537	25	2319	2324
2	5809	5814	10	4595	4600	18	3380	3387	26	2168	2174
3	5657	5661	11	4443	4448	19	3229	3234	27	2015	2022
4	5507	5511	12	4290	4297	20	3077	3082	28	1864	1869
5	5354	5359	13	4141	4145	21	2926	2932	29	1713	1719
6	5201	5207	14	3987	3992	22	2774	2779	30	1560	1567
7	5051	5055	15	3834	3841	23	2621	2627	CC	16357	16357
8	4899	4904	16	3684	3690	24	2469	2476	WC	11961	11960

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TEST DATA SHEET 24

Digital-A Data Output Warm Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.2)

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014	16257	16500	PASS	0016	16694	16500	PASS
02	0022	16251	16500		0024	16694	16500	
03	0030	16254	16500		0032	16691	16500	
04	0038	16255	16500		0040	16692	16500	
05	0046	16251	16500		0048	16697	16500	
06	0054	16251	16500		0056	16689	16500	
07	0062	16250	16500		0064	16690	16500	
08	0070	16251	16500		0072	16700	16500	
09	0078	16253	16500		0080	16693	16500	
10	0086	16257	16500		0088	16695	16500	
11	0094	16252	16500		0096	16691	16500	
12	0102	16249	16500		0104	16693	16500	
13	0110	16252	16500		0112	16694	16500	
14	0118	16253	16500		0120	16696	16500	
15	0126	16252	16500		0128	16695	16500	
16	0134	16248	16500		0136	16698	16500	
17	0142	16254	16500		0144	16697	16500	
18	0150	16252	16500		0152	16695	16500	
19	0158	16249	16500		0160	16690	16500	
20	0166	16253	16500		0168	16694	16500	
21	0174	16253	16500		0176	16695	16500	
22	0182	16256	16500		0184	16689	16500	
23	0190	16253	16500		0192	16694	16500	
24	0198	16254	16500		0200	16691	16500	
25	0206	16255	16500		0208	16693	16500	
26	0214	16256	16500		0216	16690	16500	
27	0222	16250	16500		0224	16691	16500	
28	0230	16252	16500		0232	16693	16500	
29	0238	16254	16500		0240	16694	16500	
30	0246	16255	16500		0248	16688	16500	
CC	0258	0	0		0260	0	0	
WC	0310	0	0	PASS	0312	0	0	PASS

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.

** Required = 16,500 ± 4000 counts.

METSAT/AMSU A2 System CPT ~~P/N~~ IS-1331200 Shop Order: 335079 S/H 0730 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SEIT 2-19-00

Test Systems Engineer Date

Customer Representative 2-19-00 Date

Date

(Flight Hardware Only)

Quality Control 2/19/00 7A 275

SU A2-30 A2.EXE WARM CAL MODE 19-FEB-00 00:57:57 SCAN NUMBER 645

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 1

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16257	9	16253	17	16254	25	16255
2	16251	10	16257	18	16252	26	16256
3	16254	11	16252	19	16249	27	16250
4	16255	12	16249	20	16253	28	16252
5	16251	13	16252	21	16253	29	16254
6	16251	14	16253	22	16256	30	16255
7	16250	15	16252	23	16253	CC	0
8	16251	16	16248	24	16254	WC	0

21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TDS # 24

A2-108

FINAL CPT

S/N# 335079 sp.# 0730

MSU A2-30 A2.EXE WARM CAL MODE 19-FEB-00 0U:58:02 SCAN NUMBER 646

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 2

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16694	9	16693	17	16697	25	16693
2	16694	10	16695	18	16695	26	16690
3	16691	11	16691	19	16690	27	16691
4	16692	12	16693	20	16694	28	16693
5	16697	13	16694	21	16695	29	16694
6	16689	14	16696	22	16689	30	16688
7	16690	15	16695	23	16694	CC	0
8	16700	16	16698	24	16691	WC	0

21] UP [22] DOWN

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TEST DATA SHEET 25

Warm Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.2)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor	22.86	25 ± 15	PASS
0264	Feedhorn	23.12	25 ± 15	
0266	RF Mux	24.40	25 ± 15	
0268	Mixer I.F. Amp. Channel 1	25.09	25 ± 15	
0270	Mixer I.F. Amp. Channel 2	25.24	25 ± 15	
0272	Local Oscillator Channel 1	24.79	25 ± 15	
0274	Local Oscillator Channel 2	26.13	25 ± 15	
0276	Compensation Motor	23.09	25 ± 15	
0278	Subreflector	22.98	25 ± 15	
0280	DC/DC Converter	27.28	25 ± 15	
0282	RF Shelf	24.18	25 ± 15	
0284	Detector/Preamp Assembly	24.33	25 ± 15	
0286	Warm Load Center	22.91	25 ± 15	
0288	Warm Load 1	23.00	25 ± 15	
0290	Warm Load 2	22.97	25 ± 15	
0292	Warm Load 3	23.00	25 ± 15	
0294	Warm Load 4	23.06	25 ± 15	
0296	Warm Load 5	23.03	25 ± 15	
0298	Warm Load 6	22.89	25 ± 15	
0300	Temp Sensor V. Reference	25117	**	PASS

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

METSAT/AMSU A2 System ~~CPT P/N~~ IS-1331200 Shop Order: 33507~~0~~ op.# 0730 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

Customer Representative Date 2-19-00
Date
(Flight Hardware Only)

AMSU 7 BEIT
Test Systems Engineer Date 2-19-00

Anita Navarro 2/19/00
Quality Control

ISU A2-30 A2.EXE WARM CAL MODE 19-FEB-00 0υ:58:40 SCAN NUMBER 650

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR	18068	22.86	11	RF SHELF	18732	24.18
2	FEED HORN	18049	23.12	12	DET/PREAMP	18624	24.33
3	RF MUX	18165	24.40	13	WARM LOAD CNTR	22945	22.91
4	MIXER IF CH 1	19207	25.09	14	WARM LOAD 1	23007	23.00
5	MIXER IF CH 2	19234	25.24	15	WARM LOAD 2	22951	22.97
6	LO CHANNEL 1	18852	24.79	16	WARM LOAD 3	23037	23.00
7	LO CHANNEL 2	19329	26.13	17	WARM LOAD 4	23172	23.06
8	COMP MOTOR	17493	23.09	18	WARM LOAD 5	23191	23.03
9	SUBREFLECTOR	17971	22.98	19	WARM LOAD 6	22889	22.89
10	DC/DC CONVERTER	20236	27.28		THERMAL REFERENCE	25117	

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS# 25

A2-128

FINAL CPT

S/N# 335079 sp.# 5732

TEST DATA SHEET 26
Digital-A Data Output Cold Cal Mode Synch Sequence, Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.3)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	8	8	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System ~~CPT P/N~~ IS-1331200 Shop Order: ~~335079~~ SPA 0730 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SEIT

2-19-00

Test Systems Engineer Date

Customer Representative 2-19-00 Date

Date

(Flight Hardware Only)

Quality Control 2/19/00

AMSU A2-30 A2.EXE COLD CAL MODE 19-FEB-00 00:59:51 SCAN NUMBER 659

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

COMMANDS

[9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POSIT = YES	[15]
[10] SURVIVAL HEATER POWER =	OFF	ANTENNA IN NADIR POSITION = NO	[16]
[11] MODULE TOTALLY OFF =	ON	ANTENNA IN FULL SCAN MODE = NO	[17]
[12] SCANNER A2 POWER =	ON	COLD CAL POSITION MSB = ZERO	[18]
[13] COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB = ZERO	[19]
[14] ANTENNA IN WARM CAL POSIT =	NO		

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 3

TDS #26

A2-108

FINAL CPT

S/N# 335079 0733

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	16360
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	16360
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16242
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16674
5	DIGITAL B DATA BYTE 1	00001000	146	REFLECTOR POSITION 18	16360
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	16360
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16242
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16677
10	REFLECTOR POSITION 1	16360	154	REFLECTOR POSITION 19	16360
12	REFL POS 1 2ND LOOK	16360	156	REFL POS 19 2ND LOOK	16360
14	SCENE DATA BP 1 CH 1	16244	158	SCENE DATA BP 19 CH 1	16243
16	CH 2	16676	160	CH 2	16677
18	REFLECTOR POSITION 2	16360	162	REFLECTOR POSITION 20	16360
20	REFL POS 2 2ND LOOK	16360	164	REFL POS 20 2ND LOOK	16360
22	SCENE DATA BP 2 CH 1	16242	166	SCENE DATA BP 20 CH 1	16244
24	CH 2	16673	168	CH 2	16676
26	REFLECTOR POSITION 3	16360	170	REFLECTOR POSITION 21	16360
28	REFL POS 3 2ND LOOK	16360	172	REFL POS 21 2ND LOOK	16360
30	SCENE DATA BP 3 CH 1	16239	174	SCENE DATA BP 21 CH 1	16239
32	CH 2	16676	176	CH 2	16678
34	REFLECTOR POSITION 4	16360	178	REFLECTOR POSITION 22	16360
36	REFL POS 4 2ND LOOK	16360	180	REFL POS 22 2ND LOOK	16360
38	SCENE DATA BP 4 CH 1	16243	182	SCENE DATA BP 22 CH 1	16244
40	CH 2	16672	184	CH 2	16673
42	REFLECTOR POSITION 5	16360	186	REFLECTOR POSITION 23	16360
44	REFL POS 5 2ND LOOK	16360	188	REFL POS 23 2ND LOOK	16360
46	SCENE DATA BP 5 CH 1	16271	190	SCENE DATA BP 23 CH 1	16244
48	CH 2	16703	192	CH 2	16675
50	REFLECTOR POSITION 6	16360	194	REFLECTOR POSITION 24	16360
52	REFL POS 6 2ND LOOK	16360	196	REFL POS 24 2ND LOOK	16360
54	SCENE DATA BP 6 CH 1	16334	198	SCENE DATA BP 24 CH 1	16243
56	CH 2	16774	200	CH 2	16674
58	REFLECTOR POSITION 7	16360	202	REFLECTOR POSITION 25	16360
60	REFL POS 7 2ND LOOK	16360	204	REFL POS 25 2ND LOOK	16360
62	SCENE DATA BP 7 CH 1	16317	206	SCENE DATA BP 25 CH 1	16244
64	CH 2	16748	208	CH 2	16678
66	REFLECTOR POSITION 8	16360	210	REFLECTOR POSITION 26	16360
68	REFL POS 8 2ND LOOK	16360	212	REFL POS 26 2ND LOOK	16360
70	SCENE DATA BP 8 CH 1	16244	214	SCENE DATA BP 26 CH 1	16238
72	CH 2	16676	216	CH 2	16672
74	REFLECTOR POSITION 9	16360	218	REFLECTOR POSITION 27	16360
76	REFL POS 9 2ND LOOK	16360	220	REFL POS 27 2ND LOOK	16360
78	SCENE DATA BP 9 CH 1	16243	222	SCENE DATA BP 27 CH 1	16242
80	CH 2	16676	224	CH 2	16681
82	REFLECTOR POSITION 10	16360	226	REFLECTOR POSITION 28	16360
84	REFL POS 10 2ND LOOK	16360	228	REFL POS 28 2ND LOOK	16360
86	SCENE DATA BP 10 CH 1	16246	230	SCENE DATA BP 28 CH 1	16240
88	CH 2	16675	232	CH 2	16675
90	REFLECTOR POSITION 11	16360	234	REFLECTOR POSITION 29	16360
92	REFL POS 11 2ND LOOK	16360	236	REFL POS 29 2ND LOOK	16360

ELEMENT	DESCRIPTION		VALUE	ELEMENT	DESCRIPTION		VALUE
94	SCENE DATA BP 11	CH 1	16239	238	SCENE DATA BP 29	CH 1	16241
96		CH 2	16682	240		CH 2	16679
98	REFLECTOR POSITION 12		16360	242	REFLECTOR POSITION 30		16360
100	REFL POS 12 2ND LOOK		16360	244	REFL POS 30 2ND LOOK		16360
102	SCENE DATA BP 12	CH 1	16244	246	SCENE DATA BP 30	CH 1	16242
104		CH 2	16676	248		CH 2	16674
106	REFLECTOR POSITION 13		16360	250	REFLECTOR COLD CAL POS		0E
108	REFL POS 13 2ND LOOK		16360	252	REFL COLD CAL 2ND LOOK		0E
110	SCENE DATA BP 13	CH 1	16242	254	COLD CAL DATA 1	CH 1	0
112		CH 2	16675	256		CH 2	0
114	REFLECTOR POSITION 14		16360	258	COLD CAL DATA 2	CH 1	0
116	REFL POS 14 2ND LOOK		16360	260		CH 2	0
118	SCENE DATA BP 14	CH 1	16244	302	REFLECTOR WARM CAL POS		0E
120		CH 2	16676	304	REFL WARM CAL 2ND LOOK		0E
122	REFLECTOR POSITION 15		16360	306	WARM CAL DATA 1	CH 1	0
124	REFL POS 15 2ND LOOK		16360	308		CH 2	0
126	SCENE DATA BP 15	CH 1	16239	310	WARM CAL DATA 2	CH 1	0
128		CH 2	16677	312		CH 2	0
130	REFLECTOR POSITION 16		16360				
132	REFL POS 16 2ND LOOK		16360				
134	SCENE DATA BP 16	CH 1	16240				
136		CH 2	16677				

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	18084	22.89
264	FEED HORN	18053	23.13
266	RF MUX	18170	24.41
268	MIXER/IF AMPLIFIER CHANNEL 1	19214	25.10
270	MIXER/IF AMPLIFIER CHANNEL 2	19240	25.25
272	LOCAL OSCILLATOR CHANNEL 1	18859	24.81
274	LOCAL OSCILLATOR CHANNEL 2	19335	26.14
276	COMPENSATION MOTOR	17486	23.07
278	SUB REFLECTOR	17972	22.98
280	DC/DC CONVERTER	20238	27.28
282	RF SHELF	18738	24.19
284	DETECTOR/PREAMP ASSEMBLY	18630	24.34
286	WARM LOAD CENTER	22943	22.90
288	WARM LOAD 1	23009	23.01
290	WARM LOAD 2	22955	22.98
292	WARM LOAD 3	23038	23.00
294	WARM LOAD 4	23172	23.06
296	WARM LOAD 5	23199	23.05
298	WARM LOAD 6	22893	22.90
300	TEMP SENSOR REFERENCE VOLTAGE	25117	

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER POWER	ON	ON	ON
COMPENSATOR MOTOR POWER	ON	ON	ON
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	YES	YES	YES
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	NO	NO	NO
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	ON	ON	ON
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
RF SHELF TEMPERATURE	215	24.4	215	24.4	215	24.4
COMPENSATOR MOTOR TEMPERATURE	214	22.7	214	22.7	214	22.7
SCANNER MOTOR TEMPERATURE	214	21.4	214	21.4	215	22.8
WARM LOAD TEMPERATURE	214	22.4	214	22.4	214	22.4

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
COMPENSATOR MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
SIGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
ANTENNA DRIVE +15 VDC	170	15.00	170	15.00	170	15.00
SIGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
ANTENNA DRIVE -15 VDC	148	-15.00	148	-15.00	148	-15.00
RECEIVER +10 VDC	171	10.06	171	10.06	171	10.06
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	146	5.04	146	5.04	146	5.04
ANTENNA DRIVE +5 VDC	145	4.96	145	4.96	145	4.96
GUNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
GUNN DIODE OSC #2 (CHANNEL 2) VDC	172	10.00	172	10.00	172	10.00

PRT TEMPERATURES	NO.	DEG K	NO.	DEG K
RIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
XED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
ASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES	NO.	DEG K	NO.	DEG K
IXED TARGET SHROUD	532	32.00	533	33.00
ARIABLE TARGET SHROUD	515	7.00	516	8.00
IXED TARGET N2	502	30.00	503	31.00
ARIABLE TARGET N2	507	5.00	508	6.00
EATER N2	505	1.00	506	2.00
IXED TARGET FLOW METER	504	34.00		
ARIABLE TARGET FLOW METER	509	9.00		
ASEPLATE HEATER N2	510	3.00	511	4.00
ASEPLATE N2	512	36.00	513	37.00
ASEPLATE FLOW METER	514	35.00		
DJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 26
Digital-A Data Output Cold Cal Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.3)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	8	8	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words
(data entered in decimal system)

	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

Amend #1 Oper. 8050

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

2-24-00
Test Systems Engineer Date
AMSU & SEIT
24 269 25FEB00
Quality Control

2-25-00
Customer Representative Date
Date
(Flight Hardware Only)

```
AMSU  A2-30 A2.EXE     COLD CAL MODE       24-FEB-00  20:39:00  SCAN NUMBER   509
[ 5 ] DIGITAL A DATA   ELEMENT 0000
[ 6 ] DIGITAL B DATA   ELEMENT   00
[ 7 ] ANALOG DATA      ELEMENT   00

                                     COMMANDS
[ 9 ]  MODULE POWER =              CONNECT  ANTENNA IN COLD CAL POSIT = YES [ 15 ]
[ 10 ] SURVIVAL HEATER POWER =       OFF    ANTENNA IN NADIR POSITION = NO  [ 16 ]
[ 11 ] MODULE TOTALLY OFF =          ON     ANTENNA IN FULL SCAN MODE = NO  [ 17 ]
[ 12 ] SCANNER A2 POWER =            ON     COLD CAL POSITION MSB =    ZERO [ 18 ]
[ 13 ] COMPENSATOR MOTOR POWER =     ON     COLD CAL POSITION LSB =    ZERO [ 19 ]
[ 14 ] ANTENNA IN WARM CAL POSIT = NO
       POWER [ 4 ]  ON
                    SCREEN ONLY [ 2 ]  PRINT  [ 3 ] FULL      [ 1 ] RETURN
 SELECT TOUCHSCREEN BUTTON 3
```

Test data in support of TDS 26
S/O 335079 Amend #1, Oper. 8050
A2 S/N 108 P 3,2,4,3,4,3

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	16360
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	16360
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16266
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16686
5	DIGITAL B DATA BYTE 1	00001000	146	REFLECTOR POSITION 18	16360
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	16360
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16267
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16685
10	REFLECTOR POSITION 1	16360	154	REFLECTOR POSITION 19	16360
12	REFL POS 1 2ND LOOK	16360	156	REFL POS 19 2ND LOOK	16360
14	SCENE DATA BP 1 CH 1	16272	158	SCENE DATA BP 19 CH 1	16268
16	CH 2	16689	160	CH 2	16688
18	REFLECTOR POSITION 2	16360	162	REFLECTOR POSITION 20	16360
20	REFL POS 2 2ND LOOK	16360	164	REFL POS 20 2ND LOOK	16360
22	SCENE DATA BP 2 CH 1	16267	166	SCENE DATA BP 20 CH 1	16263
24	CH 2	16684	168	CH 2	16687
26	REFLECTOR POSITION 3	16360	170	REFLECTOR POSITION 21	16360
28	REFL POS 3 2ND LOOK	16360	172	REFL POS 21 2ND LOOK	16360
30	SCENE DATA BP 3 CH 1	16262	174	SCENE DATA BP 21 CH 1	16266
32	CH 2	16691	176	CH 2	16688
34	REFLECTOR POSITION 4	16360	178	REFLECTOR POSITION 22	16360
36	REFL POS 4 2ND LOOK	16360	180	REFL POS 22 2ND LOOK	16360
38	SCENE DATA BP 4 CH 1	16267	182	SCENE DATA BP 22 CH 1	16265
40	CH 2	16685	184	CH 2	16690
42	REFLECTOR POSITION 5	16360	186	REFLECTOR POSITION 23	16360
44	REFL POS 5 2ND LOOK	16360	188	REFL POS 23 2ND LOOK	16360
46	SCENE DATA BP 5 CH 1	16265	190	SCENE DATA BP 23 CH 1	16270
48	CH 2	16683	192	CH 2	16693
50	REFLECTOR POSITION 6	16360	194	REFLECTOR POSITION 24	16360
52	REFL POS 6 2ND LOOK	16360	196	REFL POS 24 2ND LOOK	16360
54	SCENE DATA BP 6 CH 1	16267	198	SCENE DATA BP 24 CH 1	16269
56	CH 2	16687	200	CH 2	16686
58	REFLECTOR POSITION 7	16360	202	REFLECTOR POSITION 25	16360
60	REFL POS 7 2ND LOOK	16360	204	REFL POS 25 2ND LOOK	16360
62	SCENE DATA BP 7 CH 1	16272	206	SCENE DATA BP 25 CH 1	16266
64	CH 2	16687	208	CH 2	16689
66	REFLECTOR POSITION 8	16360	210	REFLECTOR POSITION 26	16360
68	REFL POS 8 2ND LOOK	16360	212	REFL POS 26 2ND LOOK	16360
70	SCENE DATA BP 8 CH 1	16262	214	SCENE DATA BP 26 CH 1	16269
72	CH 2	16687	216	CH 2	16687
74	REFLECTOR POSITION 9	16360	218	REFLECTOR POSITION 27	16360
76	REFL POS 9 2ND LOOK	16360	220	REFL POS 27 2ND LOOK	16360
78	SCENE DATA BP 9 CH 1	16264	222	SCENE DATA BP 27 CH 1	16264
80	CH 2	16691	224	CH 2	16683
82	REFLECTOR POSITION 10	16360	226	REFLECTOR POSITION 28	16360
84	REFL POS 10 2ND LOOK	16360	228	REFL POS 28 2ND LOOK	16360
86	SCENE DATA BP 10 CH 1	16264	230	SCENE DATA BP 28 CH 1	16267
88	CH 2	16689	232	CH 2	16692
90	REFLECTOR POSITION 11	16360	234	REFLECTOR POSITION 29	16360
92	REFL POS 11 2ND LOOK	16360	236	REFL POS 29 2ND LOOK	16360

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	SCENE DATA BP 11 CH 1	16264	238	SCENE DATA BP 29 CH 1	16265
96	CH 2	16686	240	CH 2	16686
98	REFLECTOR POSITION 12	16360	242	REFLECTOR POSITION 30	16360
100	REFL POS 12 2ND LOOK	16360	244	REFL POS 30 2ND LOOK	16360
102	SCENE DATA BP 12 CH 1	16266	246	SCENE DATA BP 30 CH 1	16267
104	CH 2	16691	248	CH 2	16690
106	REFLECTOR POSITION 13	16360	250	REFLECTOR COLD CAL POS	0E
108	REFL POS 13 2ND LOOK	16360	252	REFL COLD CAL 2ND LOOK	0E
110	SCENE DATA BP 13 CH 1	16267	254	COLD CAL DATA 1 CH 1	0
112	CH 2	16688	256	CH 2	0
114	REFLECTOR POSITION 14	16360	258	COLD CAL DATA 2 CH 1	0
116	REFL POS 14 2ND LOOK	16360	260	CH 2	0
118	SCENE DATA BP 14 CH 1	16267	302	REFLECTÒR WARM CAL POS	0E
120	CH 2	16687	304	REFL WARM CAL 2ND LOOK	0E
122	REFLECTOR POSITION 15	16360	306	WARM CAL DATA 1 CH 1	0
124	REFL POS 15 2ND LOOK	16360	308	CH 2	0
126	SCENE DATA BP 15 CH 1	16271	310	WARM CAL DATA 2 CH 1	0
128	CH 2	16689	312	CH 2	0
130	REFLECTOR POSITION 16	16360			
132	REFL POS 16 2ND LOOK	16360			
134	SCENE DATA BP 16 CH 1	16265			
136	CH 2	16687			

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	17471	21.73
264	FEED HORN	17596	22.26
266	RF MUX	17667	23.45
268	MIXER/IF AMPLIFIER CHANNEL 1	18698	24.12
270	MIXER/IF AMPLIFIER CHANNEL 2	18731	24.27
272	LOCAL OSCILLATOR CHANNEL 1	18341	23.82
274	LOCAL OSCILLATOR CHANNEL 2	18790	25.10
276	COMPENSATION MOTOR	16912	21.99
278	SUB REFLECTOR	17522	22.13
280	DC/DC CONVERTER	19574	26.01
282	RF SHELF	18243	23.25
284	DETECTOR/PREAMP ASSEMBLY	18123	23.38
286	WARM LOAD CENTER	22162	21.37
288	WARM LOAD 1	22228	21.48
290	WARM LOAD 2	22172	21.45
292	WARM LOAD 3	22247	21.45
294	WARM LOAD 4	22375	21.50
296	WARM LOAD 5	22394	21.47
298	WARM LOAD 6	22090	21.32
300	TEMP SENSOR REFERENCE VOLTAGE	25115	

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER POWER	ON	ON	ON
COMPENSATOR MOTOR POWER	ON	ON	ON
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	YES	YES	YES
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	NO	NO	NO
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	ON	ON	ON
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
RF SHELF TEMPERATURE	215	24.4	215	24.4	215	24.4
COMPENSATOR MOTOR TEMPERATURE	213	21.3	213	21.3	213	21.3
SCANNER MOTOR TEMPERATURE	213	20.0	213	20.0	213	20.0
WARM LOAD TEMPERATURE	213	21.0	213	21.0	213	21.0

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
COMPENSATOR MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
SIGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
ANTENNA DRIVE +15 VDC	170	15.00	170	15.00	170	15.00
SIGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
ANTENNA DRIVE -15 VDC	147	-15.05	147	-15.05	147	-15.05
RECEIVER +10 VDC	170	10.00	171	10.06	171	10.06
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	146	5.04	146	5.04	146	5.04
ANTENNA DRIVE +5 VDC	145	4.96	145	4.96	145	4.96
GUNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
GUNN DIODE OSC #2 (CHANNEL 2) VDC	172	10.00	172	10.00	172	10.00

PRT TEMPERATURES

	NO.	DEG K	NO.	DEG K
VARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
FIXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
BASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES

	NO.	DEG K	NO.	DEG K
FIXED TARGET SHROUD	532	32.00	533	33.00
VARIABLE TARGET SHROUD	515	7.00	516	8.00
FIXED TARGET N2	502	30.00	503	31.00
VARIABLE TARGET N2	507	5.00	508	6.00
HEATER N2	505	1.00	506	2.00
FIXED TARGET FLOW METER	504	34.00		
VARIABLE TARGET FLOW METER	509	9.00		
BASEPLATE HEATER N2	510	3.00	511	4.00
BASEPLATE N2	512	36.00	513	37.00
BASEPLATE FLOW METER	514	35.00		
ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 27

Digital-A Data Output Cold Cal Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.3)
Condition: Cold Cal Position MSB=0 and Cold Cal Position LSB=0

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014	16240	16500	PASS	0016	16682	16500	PASS
02	0022	16240	16500		0024	16677	16500	
03	0030	16245	16500		0032	16678	16500	
04	0038	16240	16500		0040	16682	16500	
05	0046	16241	16500		0048	16677	16500	
06	0054	16231	16500		0056	16675	16500	
07	0062	16244	16500		0064	16675	16500	
08	0070	16236	16500		0072	16681	16500	
09	0078	16241	16500		0080	16681	16500	
10	0086	16239	16500		0088	16675	16500	
11	0094	16237	16500		0096	16680	16500	
12	0102	16241	16500		0104	16678	16500	
13	0110	16241	16500		0112	16677	16500	
14	0118	16240	16500		0120	16671	16500	
15	0126	16242	16500		0128	16678	16500	
16	0134	16241	16500		0136	16671	16500	
17	0142	16244	16500		0144	16675	16500	
18	0150	16240	16500		0152	16674	16500	
19	0158	16239	16500		0160	16674	16500	
20	0166	16242	16500		0168	16676	16500	
21	0174	16242	16500		0176	16671	16500	
22	0182	16244	16500		0184	16678	16500	
23	0190	16238	16500		0192	16678	16500	
24	0198	16241	16500		0200	16678	16500	
25	0206	16241	16500		0208	16683	16500	
26	0214	16238	16500		0216	16675	16500	
27	0222	16242	16500		0224	16677	16500	
28	0230	16239	16500		0232	16674	16500	
29	0238	16241	16500		0240	16680	16500	
30	0246	16238	16500		0248	16684	16500	
CC	0258	0	0		0260	0	0	
WC	0310	0	0	PASS	0312	0	0	PASS

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

0P40730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ____________

AMSU 7 SEIT

2-19-00
Test Systems Engineer Date

R. [signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] Navarro 2/19/00
Quality Control

AMSU A2-30 A2.EXE COLD CAL MODE 19-FEB-00 01:02:09 SCAN NUMBER 676

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 1

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16240	9	16241	17	16244	25	16241
2	16240	10	16239	18	16240	26	16238
3	16245	11	16237	19	16239	27	16242
4	16240	12	16241	20	16242	28	16239
5	16241	13	16241	21	16242	29	16244
6	16237	14	16240	22	16244	30	16238
7	16244	15	16242	23	16238	CC	0
8	16236	16	16241	24	16241	WC	0

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TDS # 27
A2-128
FINAL CPT 0730
S/N # 335071

MSU A2-30 A2.EXE COLD CAL MODE 19-FEB-00 01:02:15 SCAN NUMBER 677

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 2

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16682	9	16681	17	16675	25	16683
2	16677	10	16675	18	16674	26	16675
3	16678	11	16680	19	16674	27	16677
4	16682	12	16678	20	16676	28	16674
5	16677	13	16677	21	16671	29	16680
6	16675	14	16671	22	16678	30	16684
7	16675	15	16678	23	16678	CC	0
8	16681	16	16671	24	16678	WC	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TEST DATA SHEET 28
Cold Cal Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.3)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor	22.90	25 ± 15	PASS
0264	Feedhorn	23.14	25 ± 15	
0266	RF Mux	24.43	25 ± 15	
0268	Mixer I.F. Amp. Channel 1	25.13	25 ± 15	
0270	Mixer I.F. Amp. Channel 2	25.28	25 ± 15	
0272	Local Oscillator Channel 1	24.83	25 ± 15	
0274	Local Oscillator Channel 2	26.16	25 ± 15	
0276	Compensation Motor	23.11	25 ± 15	
0278	Subreflector	22.98	25 ± 15	
0280	DC/DC Converter	27.29	25 ± 15	
0282	RF Shelf	24.21	25 ± 15	
0284	Detector/Preamp Assembly	24.37	25 ± 15	
0286	Warm Load Center	22.98	25 ± 15	
0288	Warm Load 1	23.01	25 ± 15	
0290	Warm Load 2	23.06	25 ± 15	
0292	Warm Load 3	23.05	25 ± 15	
0294	Warm Load 4	23.06	25 ± 15	
0296	Warm Load 5	23.09	25 ± 15	
0298	Warm Load 6	22.96	25 ± 15	
0300	Temp Sensor V. Reference	25117	**	PASS

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

op. 0730

METSAT/AMSU A2 System ~~CPT P/N~~ IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SETT

2-19-00
Test Systems Engineer Date

[signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

[signature] 2/19/00
Quality Control

QA 275

AMSU A2-30 A2.EXE COLD CAL MODE 19-FEB-00 01:02:37 SCAN NUMBER 680

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR	18088	22.90	11	RF SHELF	18752	24.21
2	FEED HORN	18062	23.14	12	DET/PREAMP	18643	24.37
3	RF MUX	18184	24.43	13	WARM LOAD CNTR	22982	22.98
4	MIXER IF CH 1	19227	25.13	14	WARM LOAD 1	23008	23.01
5	MIXER IF CH 2	19253	25.28	15	WARM LOAD 2	22992	23.06
6	LO CHANNEL 1	18872	24.83	16	WARM LOAD 3	23063	23.05
7	LO CHANNEL 2	19349	26.16	17	WARM LOAD 4	23174	23.06
8	COMP MOTOR	17505	23.11	18	WARM LOAD 5	23221	23.09
9	SUBREFLECTOR	17971	22.98	19	WARM LOAD 6	22922	22.96
10	DC/DC CONVERTER	20242	27.29		THERMAL REFERENCE	25117	

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TDS# 28
A2-128
FINAL CPT
S/N 335079 0730

TEST DATA SHEET 29

Digital-A Data Output Nadir Mode Synch Sequence,
Unit I.D./Serial Number and Digital-B Serial Data Verification
Sections [I], [II], and [III] (Paragraph 3.2.4.3.4.4)

Step	Element (For Ref)	Description	Recorded Value	Required Value	Pass/Fail
[I]	0001	Sync Sequence Byte 1	255	255	PASS
	0002	Sync Sequence Byte 2	255	255	↑
	0003	Sync Sequence Byte 3	255	255	
[II]	0004	Unit I.D. and Serial N	30	*	
[III]	0005	Digital B Data Byte 1	16	16	
	0006	Digital B Data Byte 2	6	6	
	0007	Digital B Data Byte 3	0	0	↓
	0008	Digital B Data Byte 4	0	0	PASS

* AMSU A2 Identification Words (data entered in decimal system)	Binary	Decimal
AMSU-A2 S/N 101	00000010	2
AMSU-A2 S/N 102	00000110	6
AMSU-A2 S/N 103	00001010	10
AMSU-A2 S/N 104	00001110	14
AMSU-A2 S/N 105	00010010	18
AMSU-A2 S/N 106	00010110	22
AMSU-A2 S/N 107	00011010	26
AMSU-A2 S/N 108	00011110	30
AMSU-A2 S/N 109	00100010	34

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: SP. 0730 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SEIT

2-19-00
Test Systems Engineer Date

[signature] 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

Anita Navarro 2/19/00 (24)
Quality Control

MSU A2-30 A2.EXE NADIR MODE 19-FEB-00 01:03:25 SCAN NUMBER 686

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

COMMANDS

9] MODULE POWER =	CONNECT	ANTENNA IN COLD CAL POSIT =	NO	[15]
10] SURVIVAL HEATER POWER =	OFF	ANTENNA IN NADIR POSITION =	YES	[16]
11] MODULE TOTALLY OFF =	ON	ANTENNA IN FULL SCAN MODE =	NO	[17]
12] SCANNER A2 POWER =	ON	COLD CAL POSITION MSB =	ZERO	[18]
[13] COMPENSATOR MOTOR POWER =	ON	COLD CAL POSITION LSB =	ZERO	[19]
[14] ANTENNA IN WARM CAL POSIT =	NO			

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 3

TP3# 29

A2-108
FINAL CPT
S/N# 335079 ~~0370~~ 0730

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	138	REFLECTOR POSITION 17	3841
2	SYNC SEQUENCE BYTE 2	11111111	140	REFL POS 17 2ND LOOK	3841
3	SYNC SEQUENCE BYTE 3	11111111	142	SCENE DATA BP 17 CH 1	16242
4	UNIT ID AND SERIAL NO	00011110	144	CH 2	16681
5	DIGITAL B DATA BYTE 1	00010000	146	REFLECTOR POSITION 18	3841
6	DIGITAL B DATA BYTE 2	00000110	148	REFL POS 18 2ND LOOK	3841
7	DIGITAL B DATA BYTE 3	00000000	150	SCENE DATA BP 18 CH 1	16242
8	DIGITAL B DATA BYTE 4	00000000	152	CH 2	16684
10	REFLECTOR POSITION 1	3841	154	REFLECTOR POSITION 19	3841
12	REFL POS 1 2ND LOOK	3841	156	REFL POS 19 2ND LOOK	3841
14	SCENE DATA BP 1 CH 1	16247	158	SCENE DATA BP 19 CH 1	16246
16	CH 2	16674	160	CH 2	16680
18	REFLECTOR POSITION 2	3841	162	REFLECTOR POSITION 20	3841
20	REFL POS 2 2ND LOOK	3841	164	REFL POS 20 2ND LOOK	3841
22	SCENE DATA BP 2 CH 1	16243	166	SCENE DATA BP 20 CH 1	16245
24	CH 2	16678	168	CH 2	16682
26	REFLECTOR POSITION 3	3841	170	REFLECTOR POSITION 21	3841
28	REFL POS 3 2ND LOOK	3841	172	REFL POS 21 2ND LOOK	3841
30	SCENE DATA BP 3 CH 1	16243	174	SCENE DATA BP 21 CH 1	16242
32	CH 2	16677	176	CH 2	16685
34	REFLECTOR POSITION 4	3841	178	REFLECTOR POSITION 22	3841
36	REFL POS 4 2ND LOOK	3841	180	REFL POS 22 2ND LOOK	3841
38	SCENE DATA BP 4 CH 1	16241	182	SCENE DATA BP 22 CH 1	16244
40	CH 2	16683	184	CH 2	16679
42	REFLECTOR POSITION 5	3841	186	REFLECTOR POSITION 23	3841
44	REFL POS 5 2ND LOOK	3841	188	REFL POS 23 2ND LOOK	3841
46	SCENE DATA BP 5 CH 1	16245	190	SCENE DATA BP 23 CH 1	16243
48	CH 2	16683	192	CH 2	16675
50	REFLECTOR POSITION 6	3841	194	REFLECTOR POSITION 24	3841
52	REFL POS 6 2ND LOOK	3841	196	REFL POS 24 2ND LOOK	3841
54	SCENE DATA BP 6 CH 1	16244	198	SCENE DATA BP 24 CH 1	16243
56	CH 2	16671	200	CH 2	16682
58	REFLECTOR POSITION 7	3841	202	REFLECTOR POSITION 25	3841
60	REFL POS 7 2ND LOOK	3841	204	REFL POS 25 2ND LOOK	3841
62	SCENE DATA BP 7 CH 1	16243	206	SCENE DATA BP 25 CH 1	16245
64	CH 2	16681	208	CH 2	16679
66	REFLECTOR POSITION 8	3841	210	REFLECTOR POSITION 26	3841
68	REFL POS 8 2ND LOOK	3841	212	REFL POS 26 2ND LOOK	3841
70	SCENE DATA BP 8 CH 1	16242	214	SCENE DATA BP 26 CH 1	16247
72	CH 2	16684	216	CH 2	16681
74	REFLECTOR POSITION 9	3841	218	REFLECTOR POSITION 27	3841
76	REFL POS 9 2ND LOOK	3841	220	REFL POS 27 2ND LOOK	3841
78	SCENE DATA BP 9 CH 1	16242	222	SCENE DATA BP 27 CH 1	16243
80	CH 2	16679	224	CH 2	16681
82	REFLECTOR POSITION 10	3841	226	REFLECTOR POSITION 28	3841
84	REFL POS 10 2ND LOOK	3841	228	REFL POS 28 2ND LOOK	3841
86	SCENE DATA BP 10 CH 1	16244	230	SCENE DATA BP 28 CH 1	16244
88	CH 2	16677	232	CH 2	16681
90	REFLECTOR POSITION 11	3841	234	REFLECTOR POSITION 29	3841
92	REFL POS 11 2ND LOOK	3841	236	REFL POS 29 2ND LOOK	3841

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	SCENE DATA BP 11 CH 1	16245	238	SCENE DATA BP 29 CH 1	16246
96	CH 2	16684	240	CH 2	16675
98	REFLECTOR POSITION 12	3841	242	REFLECTOR POSITION 30	3841
100	REFL POS 12 2ND LOOK	3841	244	REFL POS 30 2ND LOOK	3841
102	SCENE DATA BP 12 CH 1	16243	246	SCENE DATA BP 30 CH 1	16246
104	CH 2	16681	248	CH 2	16677
106	REFLECTOR POSITION 13	3841	250	REFLECTOR COLD CAL POS	0E
108	REFL POS 13 2ND LOOK	3841	252	REFL COLD CAL 2ND LOOK	0E
110	SCENE DATA BP 13 CH 1	16248	254	COLD CAL DATA 1 CH 1	0
112	CH 2	16677	256	CH 2	0
114	REFLECTOR POSITION 14	3841	258	COLD CAL DATA 2 CH 1	0
116	REFL POS 14 2ND LOOK	3841	260	CH 2	0
118	SCENE DATA BP 14 CH 1	16241	302	REFLECTOR WARM CAL POS	0E
120	CH 2	16679	304	REFL WARM CAL 2ND LOOK	0E
122	REFLECTOR POSITION 15	3841	306	WARM CAL DATA 1 CH 1	0
124	REFL POS 15 2ND LOOK	3841	308	CH 2	0
126	SCENE DATA BP 15 CH 1	16250	310	WARM CAL DATA 2 CH 1	0
128	CH 2	16678	312	CH 2	0
130	REFLECTOR POSITION 16	3841			
132	REFL POS 16 2ND LOOK	3841			
134	SCENE DATA BP 16 CH 1	16248			
136	CH 2	16678			

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
262	SCAN MOTOR	18089	22.90
264	FEED HORN	18064	23.15
266	RF MUX	18186	24.44
268	MIXER/IF AMPLIFIER CHANNEL 1	19231	25.14
270	MIXER/IF AMPLIFIER CHANNEL 2	19258	25.29
272	LOCAL OSCILLATOR CHANNEL 1	18876	24.84
274	LOCAL OSCILLATOR CHANNEL 2	19352	26.17
276	COMPENSATION MOTOR	17497	23.09
278	SUB REFLECTOR	17977	22.99
280	DC/DC CONVERTER	20244	27.29
282	RF SHELF	18755	24.22
284	DETECTOR/PREAMP ASSEMBLY	18647	24.37
286	WARM LOAD CENTER	22995	23.01
288	WARM LOAD 1	23038	23.06
290	WARM LOAD 2	23010	23.09
292	WARM LOAD 3	23082	23.09
294	WARM LOAD 4	23189	23.09
296	WARM LOAD 5	23240	23.13
298	WARM LOAD 6	22934	22.98
300	TEMP SENSOR REFERENCE VOLTAGE	25117	

AMSU A2_30 A2.EXE DIGITAL B DATA 19-FEB-00 01:03:29 PAGE 3

DESCRIPTION	STATUS	STATUS	STATUS
CANNER POWER	ON	ON	ON
OMPENSATOR MOTOR POWER	ON	ON	ON
NTENNA IN WARM CAL POSITION MODE	NO	NO	NO
NTENNA IN COLD CAL POSITION MODE	YES	NO	NO
NTENNA IN NADIR POSITION MODE	NO	YES	YES
NTENNA IN FULL SCAN MODE	NO	NO	NO
URVIVAL HEATER POWER	OFF	OFF	OFF
ODULE POWER	ON	ON	ON
OLD CAL POSITION MSB	ZERO	ZERO	ZERO
OLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
F SHELF TEMPERATURE	216	25.7	216	25.7	216	25.7
OMPENSATOR MOTOR TEMPERATURE	214	22.7	214	22.7	214	22.7
CANNER MOTOR TEMPERATURE	215	22.8	215	22.8	215	22.8
ARM LOAD TEMPERATURE	214	22.4	214	22.4	214	22.4

DESCRIPTION	VALUE	MA / VOLTS	VALUE	MA / VOLTS	VALUE	MA / VOLTS
ANTENNA DRIVE MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
COMPENSATOR MOTOR CURRENT (AVERAGE)	2	1.86	2	1.86	2	1.86
SIGNAL PROCESSING +15 VDC	170	15.00	170	15.00	170	15.00
ANTENNA DRIVE +15 VDC	170	15.00	170	15.00	170	15.00
SIGNAL PROCESSING -15 VDC	148	-15.00	148	-15.00	148	-15.00
ANTENNA DRIVE -15 VDC	148	-15.00	148	-15.00	148	-15.00
RECEIVER +10 VDC	171	10.06	171	10.06	171	10.06
RADIOMETER, RECEIVER, PROCESSOR +5 VDC	145	5.00	145	5.00	145	5.00
ANTENNA DRIVE +5 VDC	145	4.96	145	4.96	145	4.96
GUNN DIODE OSC #1 (CHANNEL 1) VDC	172	10.00	172	10.00	172	10.00
GUNN DIODE OSC #2 (CHANNEL 2) VDC	172	10.00	172	10.00	172	10.00

PRT TEMPERATURES

	NO.	DEG K	NO.	DEG K
ARIABLE TARGET	601	14.00	607	20.00
	602	15.00	608	21.00
	603	16.00	609	22.00
	604	17.00	610	23.00
	605	18.00	611	24.00
	606	19.00		
IXED TARGET	612	39.00	618	45.00
	613	40.00	619	46.00
	614	41.00	620	47.00
	615	42.00	621	48.00
	616	43.00	622	49.00
	617	44.00		
ASEPLATE	623	25.00	625	50.00
	624	26.00	626	27.00

THERMOCOUPLE TEMPERATURES

	NO.	DEG K	NO.	DEG K
'IXED TARGET SHROUD	532	32.00	533	33.00
/ARIABLE TARGET SHROUD	515	7.00	516	8.00
'IXED TARGET N2	502	30.00	503	31.00
/ARIABLE TARGET N2	507	5.00	508	6.00
IEATER N2	505	1.00	506	2.00
'IXED TARGET FLOW METER	504	34.00		
/ARIABLE TARGET FLOW METER	509	9.00		
3ASEPLATE HEATER N2	510	3.00	511	4.00
3ASEPLATE N2	512	36.00	513	37.00
3ASEPLATE FLOW METER	514	35.00		
ADJUNCT RADIATORS	549	38.00	554	55.00
	542	10.00	556	57.00

TEST DATA SHEET 30

Digital-A Data Output Nadir Mode Radiometer Data Section [V] (Paragraph 3.2.4.3.4.4)

BP	Channel-1 (23.8 GHz)				Channel-2 (31.4 GHz)			
	Element (For Ref)	Measured*	Required**	Pass/Fail	Element (For Ref)	Measured*	Required**	Pass/Fail
01	0014	16247	16500	PASS	0016	16674	16500	PASS
02	0022	16245	16500		0024	16677	16500	
03	0030	16241	16500		0032	166780	16500	
04	0038	16245	16500		0040	16680	16500	
05	0046	16247	16500		0048	16675	16500	
06	0054	16241	16500		0056	16679	16500	
07	0062	16246	16500		0064	16679	16500	
08	0070	16245	16500		0072	16678	16500	
09	0078	16247	16500		0080	16677	16500	
10	0086	16245	16500		0088	16673	16500	
11	0094	16243	16500		0096	16676	16500	
12	0102	16242	16500		0104	16676	16500	
13	0110	16245	16500		0112	16674	16500	
14	0118	16240	16500		0120	16678	16500	
15	0126	16246	16500		0128	16682	16500	
16	0134	16245	16500		0136	16680	16500	
17	0142	16245	16500		0144	16673	16500	
18	0150	16240	16500		0152	16681	16500	
19	0158	16245	16500		0160	16680	16500	
20	0166	16244	16500		0168	16679	16500	
21	0174	16244	16500		0176	16677	16500	
22	0182	16246	16500		0184	16678	16500	
23	0190	16242	16500		0192	16683	16500	
24	0198	16244	16500		0200	16684	16500	
25	0206	16247	16500		0208	16682	16500	
26	0214	16245	16500		0216	16679	16500	
27	0222	16242	16500		0224	16675	16500	
28	0230	16244	16500		0232	16680	16500	
29	0238	16249	16500		0240	16674	16500	
30	0246	16242	16500		0248	16679	16500	
CC	0258	0	0		0260	0	0	
WC	0310	0	0	PASS	0312	0	0	PASS

* Actual counts from computer printout. Rewriting counts on this data sheet is optional.
** Required = 16,500 ± 4000 counts.

o pt 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 QEIT

2-19-00

Test Systems Engineer Date

2-19-00

Customer Representative Date

Date

(Flight Hardware Only)

2/19/00

Quality Control

AMSU A2-30 A2.EXE NADIR MODE 19-FEB-00 01:04:21 SCAN NUMBER 693

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 1

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16247	9	16247	17	16245	25	16247
2	16245	10	16245	18	16240	26	16245
3	16241	11	16243	19	16245	27	16242
4	16245	12	16242	20	16244	28	16244
5	16247	13	16245	21	16244	29	16244
6	16241	14	16240	22	16246	30	16242
7	16246	15	16246	23	16242	CC	0
8	16245	16	16245	24	16244	WC	0

[21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TDS # 30
A2-108
FINAL CPT
S/N# 335074 0730

MSU A2-30 A2.EXE NADIR MODE 19-FEB-00 01:04:26 SCAN NUMBER 693

5] DIGITAL A DATA ELEMENT 0000

6] DIGITAL B DATA ELEMENT 00

7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 2

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16674	9	16677	17	16673	25	16682
2	16677	10	16673	18	16681	26	16679
3	16678	11	16676	19	16680	27	16675
4	16680	12	16676	20	16679	28	16680
5	16675	13	16674	21	16677	29	16674
6	16679	14	16678	22	16678	30	16679
7	16679	15	16682	23	16683	CC	0
8	16678	16	16680	24	16684	WC	0

21] UP [22] DOWN

POWER [4] ON SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

TEST DATA SHEET 31

Nadir Mode Temperature Sensors Section [VI] (Paragraph 3.2.4.3.4.4)

Thermistor Sensors		Recorded Value* (deg. C)	Required Value (deg. C)	Pass/ Fail
Element	Description			
0262	Scan Motor	22.90	25 ± 15	PASS
0264	Feedhorn	23.16	25 ± 15	
0266	RF Mux	24.45	25 ± 15	
0268	Mixer I.F. Amp. Channel 1	25.15	25 ± 15	
0270	Mixer I.F. Amp. Channel 2	25.31	25 ± 15	
0272	Local Oscillator Channel 1	24.86	25 ± 15	
0274	Local Oscillator Channel 2	26.19	25 ± 15	
0276	Compensation Motor	23.12	25 ± 15	
0278	Subreflector	23.00	25 ± 15	
0280	DC/DC Converter	27.32	25 ± 15	
0282	RF Shelf	24.24	25 ± 15	
0284	Detector/Preamp Assembly	24.39	25 ± 15	
0286	Warm Load Center	23.00	25 ± 15	
0288	Warm Load 1	23.07	25 ± 15	
0290	Warm Load 2	23.06	25 ± 15	
0292	Warm Load 3	23.09	25 ± 15	
0294	Warm Load 4	23.13	25 ± 15	
0296	Warm Load 5	23.10	25 ± 15	
0298	Warm Load 6	22.97	25 ± 15	
0300	Temp Sensor V. Reference	25117	**	PASS

* Value is from the STE printout sheets. Copying data to this sheet is optional.
** Count of 24,552 +1765, -1308.

08 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ____________

AMSU 7 QET 2-19-00

Test Systems Engineer Date

2-19-00

Customer Representative Date
Date
(Flight Hardware Only)

2/19/00

Quality Control

AMSU A2-30 A2.EXE NADIR MODE 19-FEB-00 01:05:09 SCAN NUMBER 699

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

DIGITAL A TEMPERATURES

NO		DATA	TEMP C	NO		DATA	TEMP C
1	SCAN MOTOR	18087	22.90	11	RF SHELF	18763	24.24
2	FEED HORN	18069	23.16	12	DET/PREAMP	18655	24.39
3	RF MUX	18193	24.45	13	WARM LOAD CNTR	22990	23.00
4	MIXER IF CH 1	19238	25.15	14	WARM LOAD 1	23043	23.07
5	MIXER IF CH 2	19271	25.31	15	WARM LOAD 2	22996	23.06
6	LO CHANNEL 1	18884	24.86	16	WARM LOAD 3	23084	23.09
7	LO CHANNEL 2	19362	26.19	17	WARM LOAD 4	23211	23.13
8	COMP MOTOR	17512	23.12	18	WARM LOAD 5	23229	23.10
9	SUBREFLECTOR	17983	23.00	19	WARM LOAD 6	22928	22.97
10	DC/DC CONVERTER	20259	27.32		THERMAL REFERENCE	25117	

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT_TOUCHSCREEN_BUTTON 2

TDS# 31
A2-108
FINAL CPT
S/N# 335079 5733

TEST DATA SHEET 32
Analog Telemetry Verification by Way of Connector J6 (Paragraph 3.2.4.3.5.1)

From	Description	To	Measured (volts)	Required (volts)	Pass/Fail
J6-02	RF Shelf A2 Temp.	J1-10	+4.44 V	3.5V ± 2V	PASS
J6-03	Comp. Motor Temp.	J1-10	+4.44 V	3.5V ± 2V	PASS
J6-04	Warm Load A2 Temp.	J1-10	+4.44 V	3.5V ± 2V	PASS
J6-22	A2 Scan Motor Temp.	J1-10	+4.44 V	3.5V ± 2V	PASS
J6-08	Scan Motor Curr.	J2-03	+2.24 V	2.0V ± 1.0V	PASS
J6-09	+15V Antenna Drive	J2-03	+3.72 V	3.5V ± 0.5V	PASS
J6-10	+5V Antenna Drive	J2-03	+3.32 V	3.0V ± 0.5V	PASS
J6-11	+15V Signal Processing	J2-03	+3.56 V	3.5V ± 0.25V	PASS
J6-12	+5V Signal Processing	J2-03	+3.08 V	3.0V ± 0.25V	PASS
J6-13	L.O. Voltage Channel 1	J2-03	+3.56 V	3.5V ± 0.5V	PASS
J6-27	Comp Motor Current	J2-03	+2.32 V	2.0V ± 1.0V	PASS
J6-28	-15V Antenna Drive	J2-03	+3.32 V	3.0V ± 0.5V	PASS
J6-29	-15V Signal Processing	J2-03	+3.08 V	3.0V ± 0.25V	PASS
J6-30	L.O. Voltage Channel 2	J2-03	+3.6 V	3.5V ± 0.5V	PASS
J6-34	Mixer/IF Voltage	J2-03	+3.6 V	3.5V ± 0.5V	PASS

OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

[signature] 2-20-00
Test Systems Engineer Date

[signature] 2-20-00
Customer Representative Date
(Flight Hardware Only)

[signature] 7A 194 2-20-00
Quality Control

TEST DATA SHEET 33

Analog Telemetry Signals by Way of the STE (Paragraph 3.2.4.3.5.2)

Description	*	Measured (Deg. C)	Required (Deg. C)	Pass/Fail
A2 Scanner Motor	Temp	21.42	25 ± 15	PASS
A2 RF Shelf A2 Temp.	Temp	24.36	25 ± 15	
A2 Warm Load	Temp	22.37	25 ± 15	
A2 Compensator Motor	Temp	22.72	25 ± 15	PASS
		(mAmps)	(mAmps)	
Ant A2 Drv Motor Current		96.93	150 mA max	PASS
Ant A2 Comp. Motor Current		97.86	150 mA max	PASS
		(Volts)	(Volts)	
Signal Processor	+15V	14.91	15.0V ± 0.75V	PASS
Antenna Drive	+15V	15.43	15.0V ± 1.5V	
Signal Processor	-15V	-15.00	-15.0V ± 0.75V	
Antenna Drive	-15V	-14.80	-15.0V ± 1.5V	
Mixer/IF	***	10.06	*** 10.0 ± 0.5V	
Signal Processor	+5V	5.00	5.0V ± 0.5V	
Antenna Drive	+5V	5.13	5.0V ± 0.6V	
L.O. #1	**	10.00	** 10.0 ± 0.5V	
L.O. #2	**	10.00	** 10.0 ± 0.5V	PASS

* Data from the printout sheet Page 8. Rewriting data on this space is optional.

** L.O. voltages from manufacturer data sheet for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.

*** Mixer/IF voltage: +8V for S/N 101 - S/N 104, +10V for S/N 105 - S/N 109.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 (SO.0730) S/N: 108

Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SETT

Test Systems Engineer 2-19-00 Date

Customer Representative 2-19-00 Date

Quality Control 2/19/00

(Flight Hardware Only)

AMSU A2-30 A2.EXE FULL SCAN MODE 19-FEB-00 01:08:50 SCAN NUMBER 726

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

ANALOG DATA

1	RF SHELF	215	24.36	DEG C	9	SIGNAL PROCESSING	-15VDC	-15.00
2	COMPENSATOR MOTOR	214	22.72	DEG C	10	ANTENNA DRIVE	-15VDC	-14.80
3	SCANNER MOTOR	214	21.42	DEG C	11	RECEIVER	+10VDC	10.06
4	WARM LOAD	214	22.37	DEG C	12	RAD/RECEIVER/SIG PROC	+5 VDC	5.00
5	ANTENNA DRIVE MOTOR CURRENT		96.93		13	ANTENNA DRIVE	+5 VDC	5.13
6	COMPENSATOR MOTOR CURRENT		97.86		14	GUNN DIODE OSC #1 CH 1	VDC	10.00
7	SIGNAL PROCESSING	+15VDC	14.91		15	GUNN DIODE OSC #2 CH 2	VDC	10.00
8	ANTENNA DRIVE	+15VDC	15.43					

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

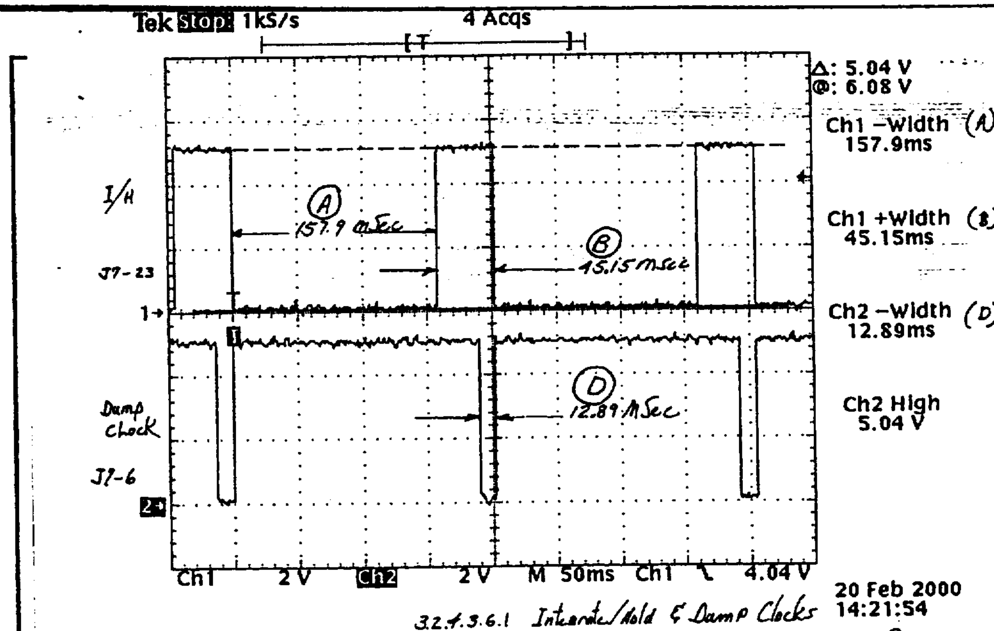
SELECT_TOUCHSCREEN_BUTTON 2

TDS# 33
A2-108
FINAL CPT
S/N# 335079 0732

AE-26156/4E
2 Apr 99

TEST DATA SHEET 34

Integrate/Hold and Dump Signal Verification (Paragraph 3.2.4.3.6.1)



S/O: 335079 OP: 0730 TDS-34 TEST ENG: [signature] Date: 2-20-00
P/N: 1331200-2-TST SN: 108 FINAL CPT Quality [signature] 2-20-00

Parameter	Measured	Required	Pass/ Fail
Scope Channel-1: Integration/Hold			
Time (A)*	157.9 ms	158 ms ± 10%	PASS
Time (B)*	45.15 ms	42 ms ± 10%	PASS
Amplitude	5.04 V	5.0 V ± 0.2V	PASS
Scope Channel-2: Dump Signal			
Time (D)*	12.89 ms	9 ms to 15 ms	PASS
Amplitude	5.04 V	5.0 V ± 0.2V	PASS

* Refer to Figure 2 for waveform configuration.

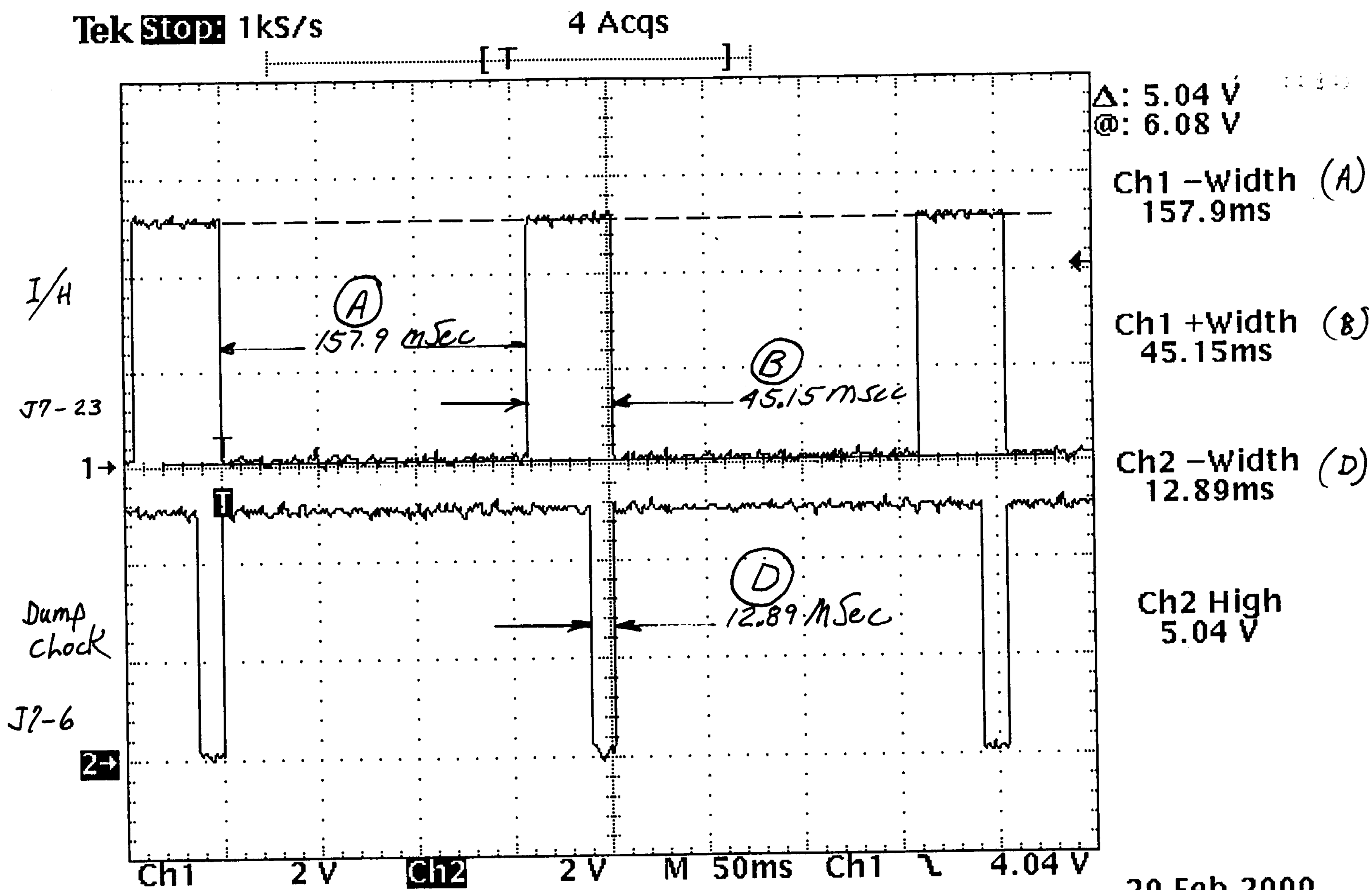
OP: 0730

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT (Final CPT) Sub CPT ________

[signature] 2-20-00
Test Systems Engineer Date

[signature] 2-20-00 (7A 194)
Quality Control

[signature] 2-20-00
Customer Representative Date
Date
(Flight Hardware Only)



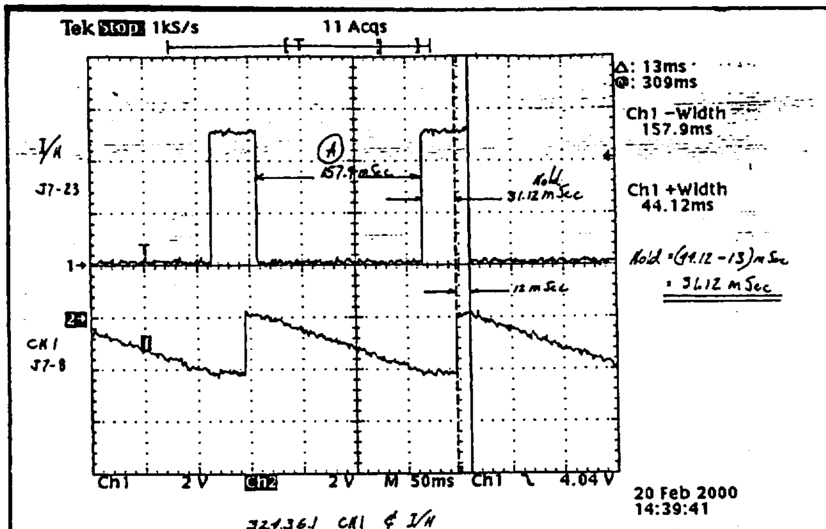
3.2.4.3.6.1 Integrate/Hold & Dump Clocks

S/O: 335079 OP: 0730 TDS-34 TEST ENG: [signature] Date: 2-20-00

P/N: 1331200-2-TST SN: 108 FINAL CPT Quality: [signature]

TEST DATA SHEET 35

Integration Time (Analog Output) Verification (Paragraph 3.2.4.3.6.2)



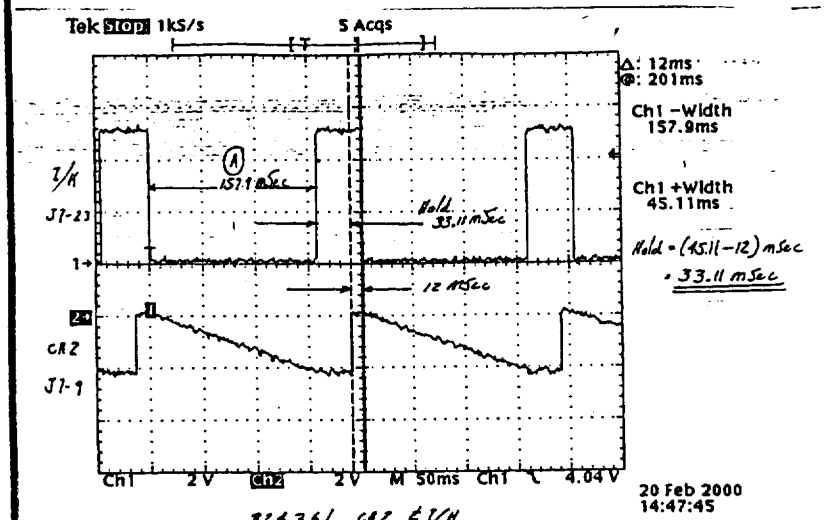
S/O: 335079 OP: 0730 TDS-35
P/N: 1331200-2-TST SN: 108 FINAL CPT
TEST ENG Date: 2-20-00
Quality

J7 - pin 8 signal
Frequency: 23.8 GHz

INTEGRATION (X) *
Measured 157.9 ms
Required 158 ms ± 10%
Pass/Fail PASS

HOLD (B-D) **
Measured 31.12 ms
Required 32 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 13 ms
Required 9 ms to 15 ms
Pass/Fail PASS



S/O: 335079 OP: 0730 TDS-35
P/N: 1331200-2-TST SN: 108 FINAL CPT
TEST ENG Date: 2-20-00
Quality

J7 - pin 9 signal
Frequency: 31.4 GHz

INTEGRATION (X) *
Measured 157.9 ms
Required 158 ms ± 10%
Pass/Fail PASS

HOLD (B-D) **
Measured 33.11 ms
Required 32 ms ± 10%
Pass/Fail PASS

DUMP (D) *
Measured 12 ms
Required 9 ms to 15 ms
Pass/Fail PASS

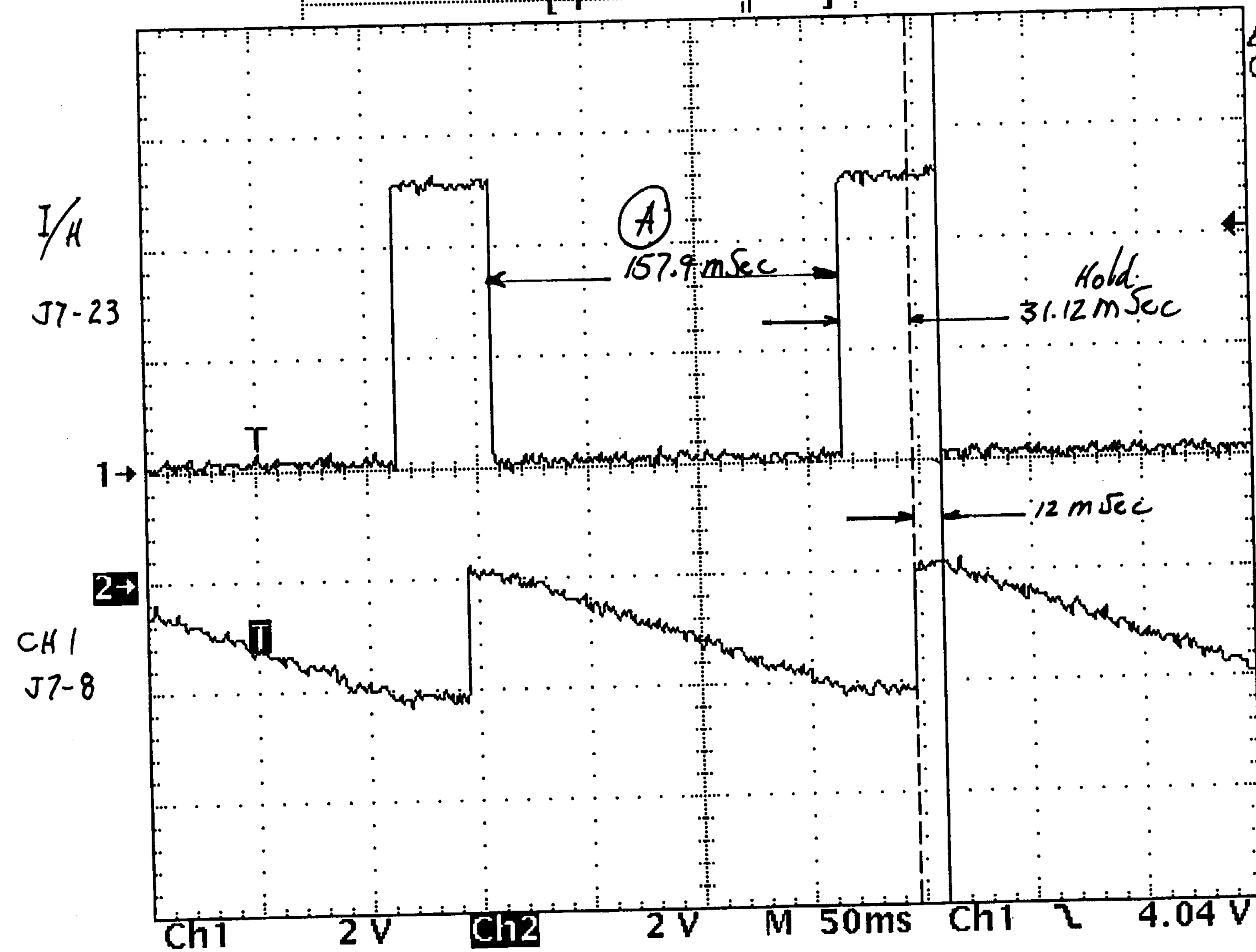
* Refer to Figure 2 for waveform configuration.
** Refer to Data Sheet 34 and Figure 2.

OP: 0730
METSAT/AMSU A2 System ~~CPT P/N IS-1331200~~ 1331200 Shop Order: 335079 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

2-20-00
Test Systems Engineer Date
7A 194
2-20-00
Quality Control

2-20-00
Customer Representative Date
Date
(Flight Hardware Only)

Tek Stop: 1kS/s 11 Acqs



Δ: 13ms
@: 309ms

Ch1 −Width
157.9ms

Ch1 +Width
44.12ms

Hold = (44.12 − 13) m Sec
= 31.12 m Sec

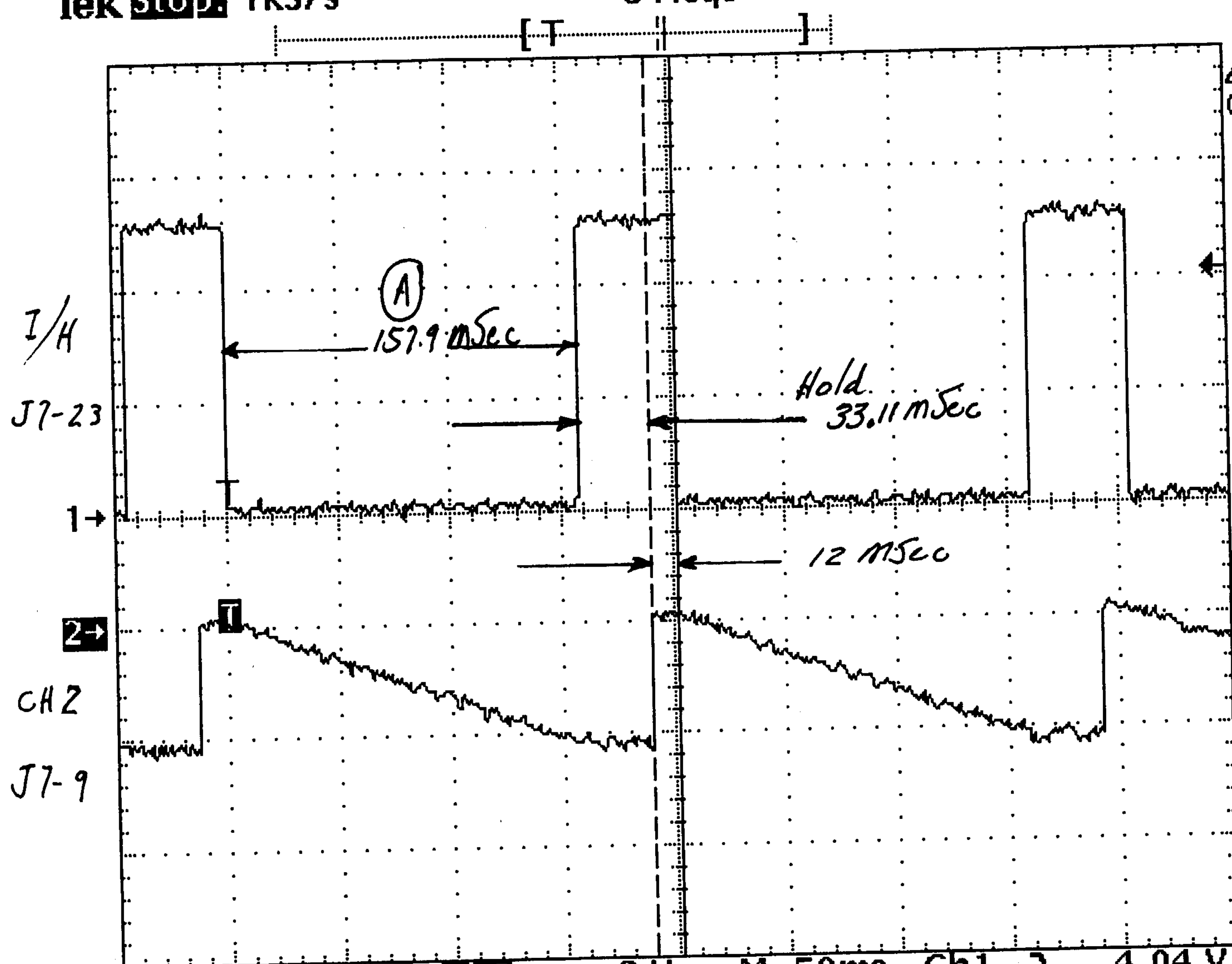
20 Feb 2000
14:39:41

32.4.36.1 CH1 ¢ I/H

S/O: 335079 OP: 0730 TDS-35 TEST ENG: [signature] Date: 2-20-00

Quality: [signature]

Tek Stop: 1kS/s 5 Acqs



Ch1 2 V Ch2 2 V M 50ms Ch1 ⤵ 4.04 V

Δ: 12ms
@: 201ms

Ch1 −Width
157.9ms

Ch1 +Width
45.11ms

Hold = (45.11 − 12) mSec
= 33.11 mSec

20 Feb 2000
14:47:45

32.4.3.6.1 CH2 & I/H

TDS-35

S/O: 335079 OP: 0730

TEST ENG: [signature] Date: 2-20-00
Quality: [signature] 7A 194 2-20-00

TEST DATA SHEET 40
Radiometer Relative NEΔT Verification (Paragraph 3.2.4.4.1.2)

Channel	Channel 1	Channel 2
NEΔT (Average of 5 data)	0.183	0.226
NEΔT (specified)*	0.30 K	0.30 K
Pass/Fail**	PASS	PASS

* For reference only.
** Use first CPT or first LPT data along with specified value for pass fail criteria.

METSAT/AMSU A2 System CPT P/N IS-1331200 Shop Order: 335079 OP# 730 S/N: 108
Circle Test: 1st CPT Final CPT Sub CPT ________

AMSU 7 SEIT

2-19-00 ________ 2-19-00
Customer Representative Date
Date
(Flight Hardware Only)

Test Systems Engineer Date
2/19/00
Quality Control

74 275

A2 FUNCTIONAL TEST RESULTS
A2.EXE 19-FEB-00 01:24:28

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
1	296.37	16248.0	13525.0	0.079	0.175
2	296.37	16689.0	13731.0	0.073	0.199

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT_TOUCHSCREEN_BUTTON 2

TDS# 40
A2-108
FINAL CPT
S/N# 335094 SP# 2230

A2 FUNCTIONAL TEST RESULTS 01:25:24
A2.EXE 19-FEB-00

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
1	296.37	16248.0	13530.0	0.080	0.188
2	296.37	16688.0	13740.0	0.073	0.220

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT_TOUCHSCREEN_BUTTON 2

A2 FUNCTIONAL TEST RESULTS 19-FEB-00 01:26:28
A2.EXE

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
1	296.38	16248.0	13535.0	0.080	0.175
2	296.38	16689.0	13749.0	0.074	0.240

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT_TOUCHSCREEN_BUTTON 2

A2.EXE A2 FUNCTIONAL TEST RESULTS 19-FEB-00 01:27:24

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
1	296.37	16247.0	13540.0	0.080	0.196
2	296.37	16688.0	13756.0	0.074	0.243

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT_TOUCHSCREEN_BUTTON 2

A2 FUNCTIONAL TEST RESULTS
19-FEB-00 01:28:20
A2.EXE

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
1	296.38	16247.0	13541.0	0.080	0.181
2	296.38	16688.0	13758.0	0.074	0.227

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

RETURN [1]

[5] PRINT DISTRIBUTION GRAPH

SELECT_TOUCHSCREEN_BUTTON 2

Electronic Systems Plant
P.O. Box 296
Azusa, California 91702-0296
CAGE/Facility Ident: 70143

GENCORP
AEROJET

AE-26151/5E
11 February 1999

Superseding
AE-26151/5D
22 September 1998

PROCESS SPECIFICATION

TEST PROCEDURE, ELECTROMAGNETIC INTERFERENCE (EMI)/ ELECTROMAGNETIC RADIATION (EMR) AND ELECTROMAGNETIC COMPATIBILITY (EMC) FOR THE METSAT/METOP ADVANCED MICROWAVE SOUNDING UNIT–A (AMSU-A)

Contract No.: NAS5-32314

Prepared for:

NASA/Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

TABLE OF CONTENTS

FIGURES

TABLES

TEST DATA SHEETS

1. SCOPE

This document establishes the general methods and procedures for electromagnetic interference (EMI), electromagnetic radiation (EMR), and electromagnetic compatibility (EMC) testing of the Meteorological Satellite (METSAT) Advanced Microwave Sounding Unit - A (AMSU-A). The test requirements, test conditions, and procedures herein are in accordance with the applicable detail specification sheets and use the standard techniques of MIL-STD-461 and MIL-STD-462 as modified by General Instrument Interface Specification (GIIS) IS-3267415, paragraph 3.6.

1.1 ***Purpose***. The purpose of this test procedure is to define the methods and procedures to be used to demonstrate compliance of the AMSU-A instrument with the applicable specification requirements. In this document, the test facilities, equipment, and conditions are identified, the performance criteria are defined, and step-by-step test procedures are included. Table I lists the test methods to be used and cross references the paragraphs in the requirements documents that will be satisfied by these methods and by performance of the test procedures herein.

Table I. Compliance Matrix

Test Method	Paragraph	S-480-79 Appendix D	IS-2617547	IS-2624483	IS-3267415
CE01* 2/	3.4.5	3.5.2.1	3.4.2	3.4.2	3.6.1.1
CE03 2/	3.4.5	3.5.2.1	3.4.2	3.4.2	3.6.1.1
RE02 1/ 2/	3.4.6	3.5.2.1	3.4.2	3.4.2	3.6.1.4.2
RE04**	3.4.7	3.5.2.1	3.4.1	3.4.1	3.5.2
CS01	3.4.8	3.5.2.1	3.4.2	3.4.2	3.6.1.2
CS02 2/	3.4.9	3.5.2.1	3.4.2	3.4.2	3.6.1.2
CS06 2/	3.4.10	3.5.2.1	3.4.2	3.4.2	3.6.1.3
RS03 2/	3.4.11	3.5.2.1	3.4.2	3.4.2	3.6.1.5

* No emanation in the frequency range specified by this test method are present in the test sample.

** No AC emanation in the frequency range specified by this test method are present in the test sample.

1/ For Acceptance Test only. Perform electric field radiation frequency range 2010-2040 MHz (para. 3.4.6) and frequency range of Table IV.

2/ Comply with METOP specifications MO-IC-MMT-A1-0001 (AMSU-A1) and MO-IC-MMT-A2-0001 (AMSU-A2), and per Table A-III requirements.

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2. APPLICABLE DOCUMENTS

2.1 ***Government documents***. The following documents of the exact issue shown, form a part of this specification to the extent specified herein.

2.1.1 *NASA-Goddard Space Flight Center (GSFC)*

SPECIFICATIONS

S-480-79	Performance and Operation Specification for the Advanced Microwave Sounding Unit (AMSU)
S-480-80	Performance Assurance Requirements for the Advanced Microwave Sounding Unit (AMSU)

OTHER DOCUMENTS

MO-IC-MMT-A1-0001	Advanced Microwave Sounding Unit-A1, Instrument Interface Control Document (METOP)
MO-IC-MMT-A2-0001	Advanced Microwave Sounding Unit-A2, Instrument Interface Control Document (METOP)
RCA-IS-2617547	Unique Instrument Interface Specification for the Advanced Microwave Sounding Unit Module A1 (AMSU-A1) (UIIS)
RCA-IS-2624483	Unique Interface Specification for the Advanced Microwave Sounding Unit A2 (AMSU-A2) (UIIS)
RCA-IS-3267415	ATN-KLM General Interface Specification (GIIS)

2.1.2 *Military*

SPECIFICATIONS

MIL-B-5087B Interim Amendment. 3 24 Dec 84	Bonding, Electrical, and Lightning Protection, for Aerospace Systems

STANDARDS

MIL-STD-461C 8 Aug 86	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-462 Notice 6 15 Oct 87	Electromagnetic Interference Characteristics, Measurement of
MIL-STD-463A 01 Jun 77	Definitions and System of Units, Electromagnetic Interference and Electromagnetic Compatibility Technology

MIL-STD-45662 Notice 3 14 Dec 84	Calibration Systems Requirements

(Copies of military documents required by suppliers in connection with specific procurement functions should be obtained as indicated in the Department of Defense Index of Specifications and Standards.)

2.2 ***Non-Government documents***. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the exact issue shown shall apply.

2.2.1 ***Aerojet documents***

SPECIFICATIONS

AE-26156/3	AMSU-A1 System, Comprehensive Performance Test and Limited Performance Test
AE-26156/4	AMSU-A2 System, Comprehensive Performance Test and Limited Performance Test

STANDARD

STD-2454	Requirements for Electrostatic Discharge Control (Excluding Electrically Initiated Explosive Devices)

DRAWINGS

1331200	AMSU Assembly, A2
1331720	AMSU Assembly, A1

(Copies of Aerojet documents required by suppliers in connection with specific procurement functions should be obtained from Aerojet, CAGE 70143, P.O. Box 296, Azusa, California 91702-0296.)

2.2.2 ***Other documents.***

HP-125	Computer Controlled System Operator's Manual
HP-8566	Spectrum Analyzer Operating and Programming Manual
HP-85864A	EMI Measurement Software Operation Manual

3. REQUIREMENTS

3.1 *Test facility.* The test shall be conducted in a shielded enclosure with minimum dimensions of 10 feet long, 10 feet wide, and 10 feet high. The enclosure shall provide a minimum of 80 dB of attenuation to an electric field from 14 kHz to 10 GHz. The shielded test enclosure shall be serviced with 28, 10, and 5 volts DC filtered power as required.

3.1.1 *Test instrumentation.* The instrumentation for performance of the tests will consist of test equipment, accessories, and fixtures selected and configured for accuracy and effectiveness in accordance with the applicable requirements of MIL-STD-461 and MIL-STD-462, and the applicable test procedure. Calibration of the test instrumentation shall be current and in accordance with the applicable requirements of MIL-STD-461, MIL-STD-462, the applicable manufacturer's published data, and MIL-STD-45662. Specific instrumentation used shall be noted on the applicable test data sheets and in the final test report. Alternate instrumentation and procedures may be invoked when applicable. Specific instrumentation used for each of the EMI/EMC tests described herein shall be in accordance with Table A-I of Appendix A.

3.1.1.1 *Meter settings.* Whenever possible, the range setting of measuring equipment shall be such that the meter reading is in the section of the scale as follows:

a. Voltage and current reading: The upper one-third of the meter scale

b. Resistance readings: The one-third section of the scale closest to the 0-ohm mark

c. Field intensity readings: Mid-range of the meter scale.

3.1.1.2 *Multi-range settings.* Measurements that may be obtained on separate ranges on multi-range equipment shall be measured on each range to assure measurement continuity. Disparities in the resulting measurements of more than ±2 dB, if occurring, shall be resolved by adoption of the highest reading obtained, or by recalibration of the item of test equipment, applicable accessories, and test setup, as warranted.

3.1.1.3 *Measurement accuracies.* All measurements made in accordance with this procedure shall have the following accuracies, unless otherwise specified in a particular test:

a. Frequency accuracy: ±2 percent

b. Amplitude accuracy: ±2 dB.

3.1.2 *Limitations and restrictions.* The following limitations and restrictions apply to the test facility and test instrumentation used in the tests described herein:

a. Radiated emissions: If no EMI emissions above background noise levels are detected in the range of 400 MHz to 1 GHz during those tests, no measurements shall be made above 1 GHz. Otherwise, the full test range to 2 GHz shall be measured.

b. Conducted susceptibility levels: Injected susceptibility test voltages and spike transients shall be limited to the extent that resulting test currents do not exceed the fuse steady-state current limit or normal current rating for the test article. The latter condition is a credible limit for potential external EMI sources, and is adopted as a procedural safeguard against resonance failures in test article components at levels exceeding credible input power delivery capabilities. Under these conditions, the minimum power ripple requirements of IS-3267415 shall be met.

c. Shielded enclosure frequency range: The shielded enclosure may be limited in its use for radiated emissions measurements and radiated field susceptibility tests above 1 GHz due to unpredictable enclosure resonance occurrences, net leakage levels, and space for the installation of suitable anechoic (RF absorbing) materials. Accordingly, as a tradeoff in testing convenience versus the cost in time and materials to correct potential shielded enclosure reflections and resonances as may interfere with RE02 measurements or RS03 field generations, a clear area in one of the electronic laboratories may be utilized as an alternate test site

where such clear area complies with applicable MIL-STD-461 and MIL-STD-462 requirements. Another alternative may include testing to be performed at an outside test facility.

WARNING

No radiated field susceptibility test procedure will be initiated, or test level applied, that will risk the exposure of personnel to field strengths in excess of 2 mW/cm^2.

d. Radiated susceptibility safety: To support this restriction, test personnel and operating-control equipment will be stationed outside the closed illumination test chamber, or in a separate shielded chamber.

3.1.3 ***Test setup***. The test article test instrumentation placement and dimensional relationships, with respect to facility and equipment geometries, shall be in accordance with the requirements specified in MIL-STD-461, MIL-STD-462, and the applicable specification sheet. Bonding jumpers, as required, shall be in accordance with MIL-B-5087 requirements.

3.2 ***Required procedures and operations.*** The test article shall be subjected to the examinations and tests specified in Paragraph 3.4 herein.

3.3 ***Test conditions.*** The following paragraphs shall apply to all tests performed under this document.

3.3.1 ***Standard ambient conditions.*** The tests shall be performed under temperature and pressure conditions defined in STD-2454.

3.3.2 ***Test tolerances.*** The tolerances allowed on test conditions are intended only to provide for the accuracy of such items as instrumentation and controls. Test conditions shall be as close as possible to the nominal or center values specified and in no instance shall they exceed the tolerances specified.

3.3.3 ***Read-out accuracy***. Performance parameters are specified either as limits or as nominal values with plus-or-minus tolerances. These limits and tolerances shall be regarded as absolute, and the inaccuracies of measuring equipment shall not be interpreted as part of measured values in such a way that out-of-limit measurements may appear in-limit.

3.3.4 ***Operation and control of test article.*** The detailed operation and control of the test article, test fixtures, and supporting instrumentation applicable to each inspection specified herein are described in the applicable detail specification sheet.

3.3.5 *Control of facilities and equipment*

3.3.5.1 ***General instructions.*** Equipment, cables, apparatus, and personnel not actively engaged in, or otherwise essential to, the test being performed shall not be present in the shielded enclosure and associated test areas during the tests. All authorized equipment and support services necessary for the performance of the tests shall be available and operational during the tests. Nearby operating equipment found to exert a compromising influence on test performance, results, or monitoring abilities shall not be operating during affected portions of the test.

3.3.5.2 ***Test site and test equipment ambient levels.*** The ambient electromagnetic level during testing, inclusive of measuring equipment internal noise levels, measured with the test article turned off, shall be at least 6 dB below the applicable test specified limit. Where noncompliances are encountered, either the high ambient source may be traced and appropriately reduced and attenuated, or a technique based on the method of MIL-STD-462 may be used to separate and measure test article EMI emissions from high ambient levels.

3.3.5.3 ***Open area testing.*** Open area testing, as defined in MIL-STD-463, shall not be employed. However, the basic objective principles applicable to open area testing will be applied, to the extent possible, in any tests that are performed in laboratory areas outside the EMI test laboratory shielded enclosures.

3.3.5.4 *Test spectra*

3.3.5.4.1 ***Specification limit and frequency criteria.*** The test setup, including test article orientation and operation, shall be configured to accurately simulate the modes and conditions of highest emissions and lowest susceptibility thresholds, as applicable. This shall include considerations of test article operation at both the high and low extremes of the input operating voltage range. The entire specified frequency range for each applicable test shall be scanned. Attention shall be directed toward ensuring that measurements are made at the test article critical frequencies as identified in the applicable specification sheet. For susceptibility tests, swept and discrete frequency tests shall be applied in incremental steps up to either:

a. The susceptibility threshold, if any, or

b. 6 dB above the specified limit.

Apparent susceptibility thresholds shall be recorded, and then scanned more extensively, in order to determine the frequency band and peak envelope of the susceptibility thresholds. Susceptibility threshold determinations shall be made in accordance with the criteria given in the applicable specification sheet.

3.3.5.4.2 ***EMI safety margins.*** Following incorporation of all applicable data correction factors, electromagnetic interference safety margins (EMISM) shall be determined for both emission and susceptibility test results relative to the specified limits.

3.4 *Detailed procedures*

3.4.1 ***Responsibility for inspection.*** Test implementation and execution, approved changes, data recording, test limitations, test article performance, and related considerations in accordance with this specification, MIL-STD-461, MIL-STD-462, and the requirements of the applicable test article specification, shall be given to the government prior to the start of the EMI tests herein, so that a representative may be designated to witness the testing.

3.4.2 ***Monitoring procedure for equipment.*** Test equipment calibration schedules and procedures shall comply with the requirements of MIL-STD-45662. Before performing examinations and tests in accordance with this procedure, all test equipment shall be verified as being within its current calibration period. Calibration or alignment, necessary for operation of the equipment within the requirements of this document, shall be performed when required.

3.4.3 ***Pretest verifications and baseline performances***

3.4.3.1 ***Test article functional validation***

3.4.3.1.1 ***Pre-test functional validation.*** The test article shall be turned on and operated in accordance with the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4. Compliance with the applicable criteria of these specifications shall be the basis for continuing the EMI/EMC tests. The data recorded during pre-test validation shall be used as part of the comparison baseline for subsequent evaluations of test article performance during the EMI tests.

3.4.3.1.2 ***Test article ambient emissions profile.*** Upon completion of the pre-test functional validation, the test article shall be operated in the mode specified in 3.4.4.3 or Appendix B. The steady-state EMI emissions shall be scanned using the spectrum analyzer. Significant and prominent amplitudes and frequencies shall be noted in the engineering log book for subsequent comparison with results obtained during the EMI tests that follow. This noted spectral data shall be referred to as the test article ambient EMI profile. Both conducted and radiated emissions profile measurements shall be made during the course of the EMI tests in accordance with the applicable test sequence and setups.

3.4.4 ***Functional test.*** The functional test will be run prior to the EMC test to ensure that the AMSU-A instrument is operating within specified limits. During EMC testing the AMSU-A instrument will have its diagnostic program running in a looping mode so that EMI-induced errors may be detected.

3.4.4.1 ***Test setup.*** The EMI compatibility test shall be conducted utilizing AMSU-A STE and AMSU-A/STE cables.

3.4.4.2 ***Test to be performed.*** The following tests will be performed on the indicated power lines or units (refer to Table A-III of Appendix A for further detailed explanation):

a. Conducted Emission (CE01/CE03)
+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return
+28V Safety Heater
+28V Safety Heater Return

b. Radiated Emission (RE02 and RE04 static H field)
AMSU-A1
AMSU-A2

c. Conducted Susceptibility (CS01 and CS02)
+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return

d. Conducted Susceptibility (CS06)
+28V Main Bus
28V Main Bus Return

+28V Analog Telemetry Bus
28V Analog Telemetry Bus Return

+28V Pulse Load Bus
28V Pulse Load Bus Return

+10V Interface Bus
10V Interface Bus Return

e. Radiated Susceptibility (RS03)
AMSU-A1 and AMSU-A2

3.4.4.2.1 ***Power line pin allocation.*** The power lines will be routed together in order to minimize the number of tests to be performed. Each wire will be connected to a feedthrough capacitor as indicated in Table II.

Table II. Power Lines Routing

From	To
+28V Feedthrough	AMSU A1 J1-1
Capacitor Main Bus	AMSU A2 J1-1
28V Feedthrough	AMSU A1 J1-3
Capacitor Main Bus Return	AMSU A2 J1-3
+28V Feedthrough	AMSU A1 J1-5
Capacitor Pulse Load	AMSU A2 J1-5
28V Feedthrough	AMSU A1 J1-7
Capacitor Pulse Load Return	AMSU A2 J1-7
+28V Feedthrough	AMSU A1 J1-9
Capacitor Analog Telemetry Bus	AMSU A2 J1-9
28V Feedthrough	AMSU A1 J1-10
Capacitor Analog Telemetry Bus Return	AMSU A2 J1-10
+10V Feedthrough	AMSU A1 J4-12
Capacitor Interface Bus	AMSU A2 J4-12
10V Feedthrough	AMSU A1 J4-13
Capacitor Interface Bus Return	AMSU A2 J4-13

3.4.4.3 ***Mode of operation.*** Unless otherwise specified in specific test, the AMSU-A will be tested in the IN ORBIT mode of operation. This is also known as the "Full Scan Mode."

3.4.4.4 ***Computer Controlled System (CCS) measurement system calibration.*** Set up and operate all required equipment in the Computer Controlled System (CCS) in accordance with the latest revision of the operator's manual. Use the mini-floppy disks containing HP Basic 2.0, Version 3.1, of the 9836.461 system disk, and the project program disk which contains the preliminary program test routines. Verify that the CCS Operating System is the proper one to be used with the particular receiver. Install the system disk in the HP 9836 right-hand drive, and the Basic 2.0 disk in the left-hand drive.

3.4.4.4.1 ***Spectrum analyzer.*** If the HP 8566 spectrum analyzer or equivalent is used for measuring the conducted or radiated emissions, the system calibration shall be conducted in accordance with the HP Operating and Programming Manual and the HP 85864A EMI Measurement Software Operation Manual.

3.4.4.5 ***Susceptibility monitors.*** The monitors shown in Table III will be observed/recorded during the performance and susceptibility testing.

Table III. Monitors for Susceptibility Test

Susceptibility	Line/Item	Monitor
Conducted	28V Main Power, Main Load Bus	Data output all channels
CS01, CS02, and CS06	28V Pulse Load Bus	Antenna Position
Radiated RS01 and RS03	AMSU-A Enclosure	Data output all channels

3.4.4.6 ***Pass/fail criteria.*** The pass/fail criteria for the conducted and radiated emissions test shall be determined by inspection of the recorded emissions levels when compared to the specification limits. All emissions shall be on or below the specification limits. When narrowband emissions exceed the broadband limits or transient spikes exceed the narrowband or

broadband limits, the specific emission shall be identified and exempted from these criteria. The identification of broadband and narrowband emission shall be in accordance with the test methods of paragraph 4.2.6 in MIL-STD-462.

Extensive EMI testing has been conducted at both the component level and the AMSU-A sensor system level. These tests have resulted in the incorporation of hardware corrective measures and established a thorough understanding of EMI susceptibility concerns for AMSU-A system performance. The primary concern is associated with collection of radiometric data.

An STE EMI data collection program has been developed and is included in the bonded test software of the STE. Operation of the system and the EMI data collection program will be coordinated with operation of the EMI susceptibility signal sweeps.

The EMI data collected will provide about a five scan period at the beginning and end of each data collection period which will allow comparison of each channel's normal radiometric response with and without the interference present. The data will be presented in the form of noise distribution plots for each of the radiometric channels and as a summary report for all channels. These data shall be reviewed as follows:

a. Review the summary data and identify channels with alarm counts greater than ten or channels that have sigma values that are a factor of two greater than observed in baseline checks made periodically during the test.

b. Examine the noise distribution plots for channels identified in the above paragraph, and look for disruptions during the period when the EMI signal sweep was made. If an EMI disruption results in a peak-to-peak increase in channel noise which is less than twice the normal level or, if the disruption creates a level shift in the noise data which is equal to or less than the normal noise level, then it is acceptable (pass).

c. Examine all remaining plots for disruptions, identify, and file the data.

d. If any channel fails, additional sweeps will be made over a reduced frequency range and at reduced amplitudes as necessary to determine the threshold of the susceptibility.

The test will continue to establish an overall assessment of the behavior. The EQUIPMENT LIMIT (EL) column will be checked when the test equipment cannot deliver the required level. Since the test equipment meets the power requirements of MIL-STD-461 and the AMSU-A instrument is not susceptible to the output of the signal source, a check on this column indicates the unit passed the test requirement. A check in the SPECIFICATION LIMIT (SL) column indicates the AMSU-A instrument met the requirements.

3.4.5 ***CE01/CE03 test.*** This test shall measure the conducted emissions on power lines from 30 kHz to 50 MHz by measuring the current levels present in the power lines of paragraph 3.4.4.2.a or Table A-III of Appendix A, as applicable. The METOP conducted emissions will be performed in the differential and common mode.

3.4.5.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Computer Control System Spectrum Analyzer, HP 8566B, HP 3562B

b. Amplifier, HP 461A, HP 8447F

c. Feedthrough Capacitors, Solar 6512-106R. METOP will use LISN's as shown in Figure 1.

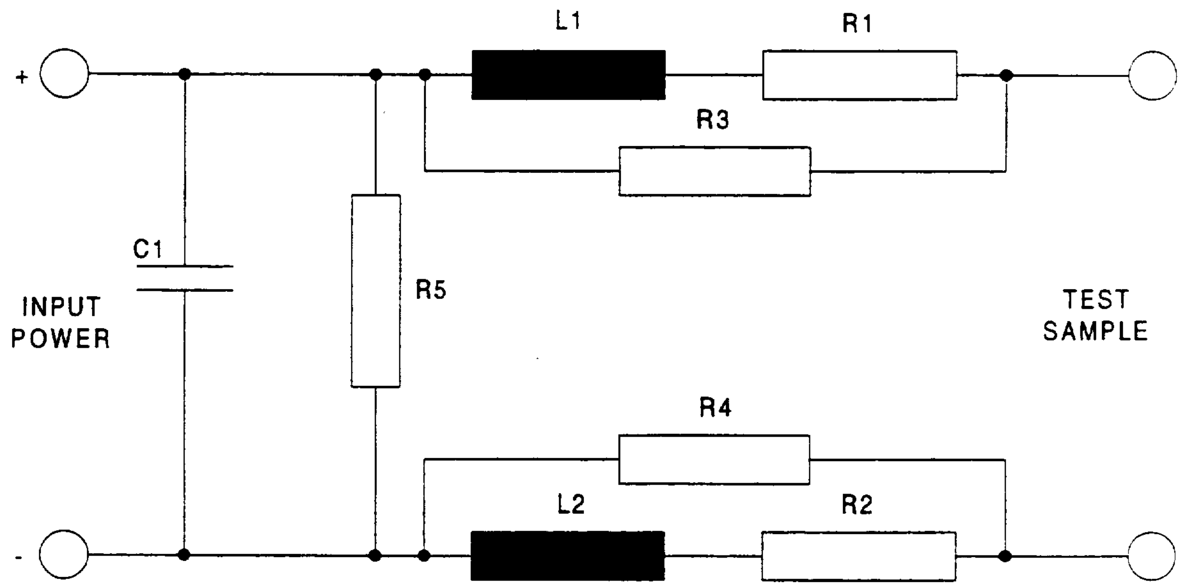
d. Computer, HP 9836

e. Current Probe, AIL Tech 91550-2B

f. Printer, HP 2673A

g. Plotter, HP 7090A

h. Filter Box, Aerojet, T-1289992-1



R1, R2	=	20 mOhm ± 5 mOhm
R3, R4	=	25 Ohm ± 5 %
R5	=	50 kOhm ± 5%
C1	=	19000 µF ± 5%
L1, L2	=	2 µH ± 5%

Figure 1. LISN Circuit Diagram

3.4.5.2 *Test limits*

3.4.5.2.1 ***Imposed limits.*** The level of conducted emissions permitted from 10 kHz to 50 MHz shall meet the requirements of IS-3267415. The limits are shown in Figure 2. The METOP shall meet the conducted emission limits from 30 Hz to 50 MHz as shown in Figures 3 and 4. The limits provided in Figures 3 and 4 are for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.5.2.2 ***Corrected limits***. The imposed limits shall be adjusted by correcting for the appropriate probe factor.

3.4.5.3 *Test procedure*

3.4.5.3.1 *Preparation*

1. Connect the equipment under test as shown in Figure 5a and the power lines as indicated in 3.4.4.2.a or Table A-III of Appendix A, as applicable. Fill in data on equipment actually used in Equipment Log on Test Data Sheet (TDS) 1 in Appendix B.

2. Connect the AMSU and support equipment for a functional check.

3. Perform the functional test per the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4, paragraph 3.2.3.5.

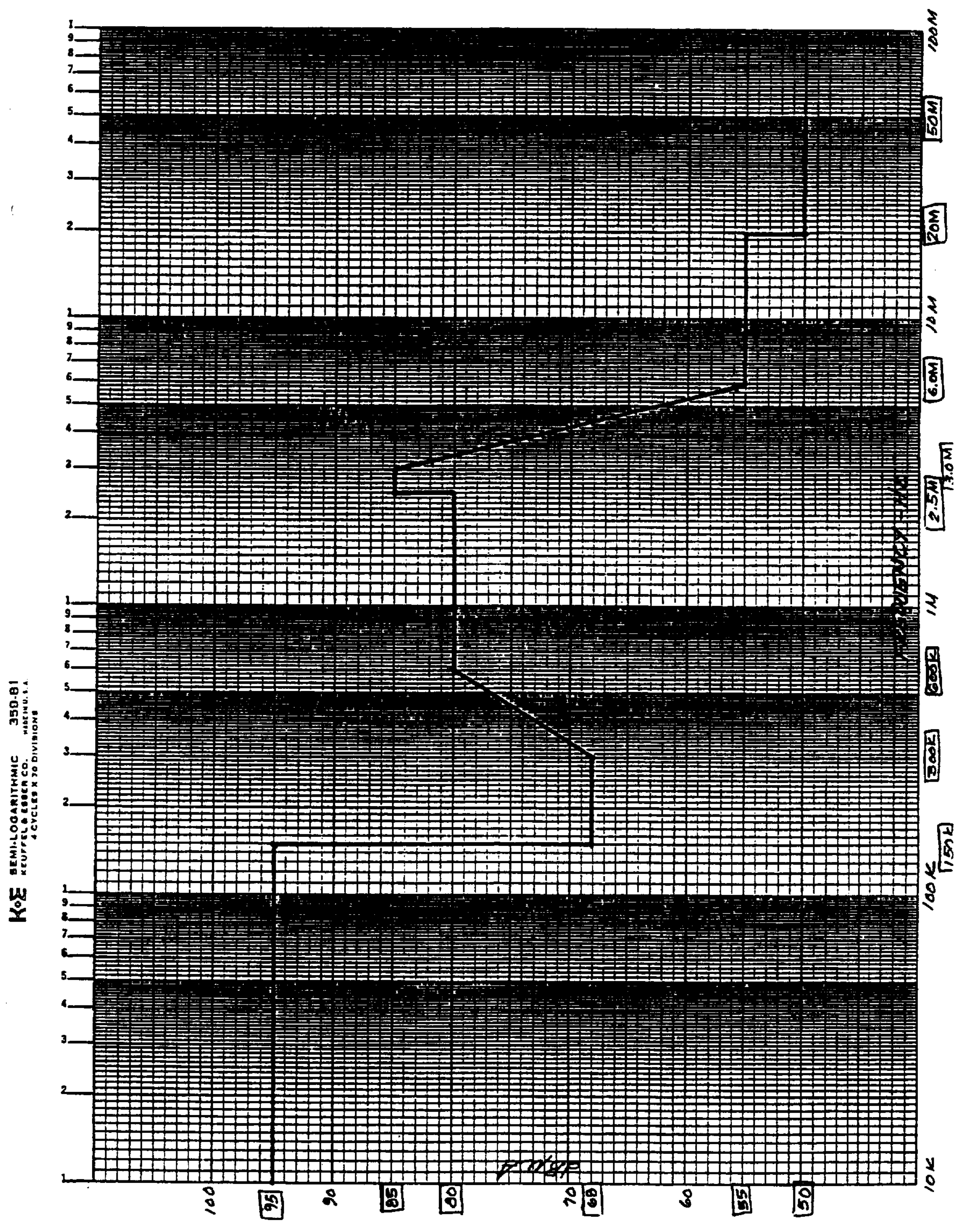


Figure 2. Narrowband Conducted Emissions Limits on Power Leads

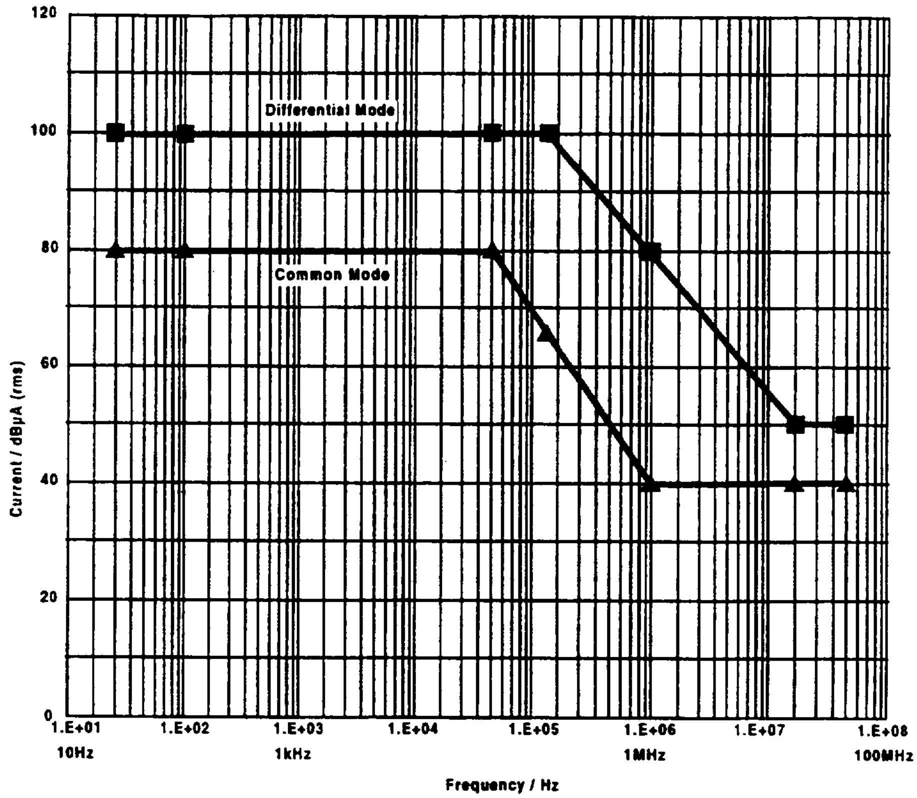


Figure 3. Conducted Emission Limit, NB, DM, CM, 28V Reg. Power Leads, PLM Instrument

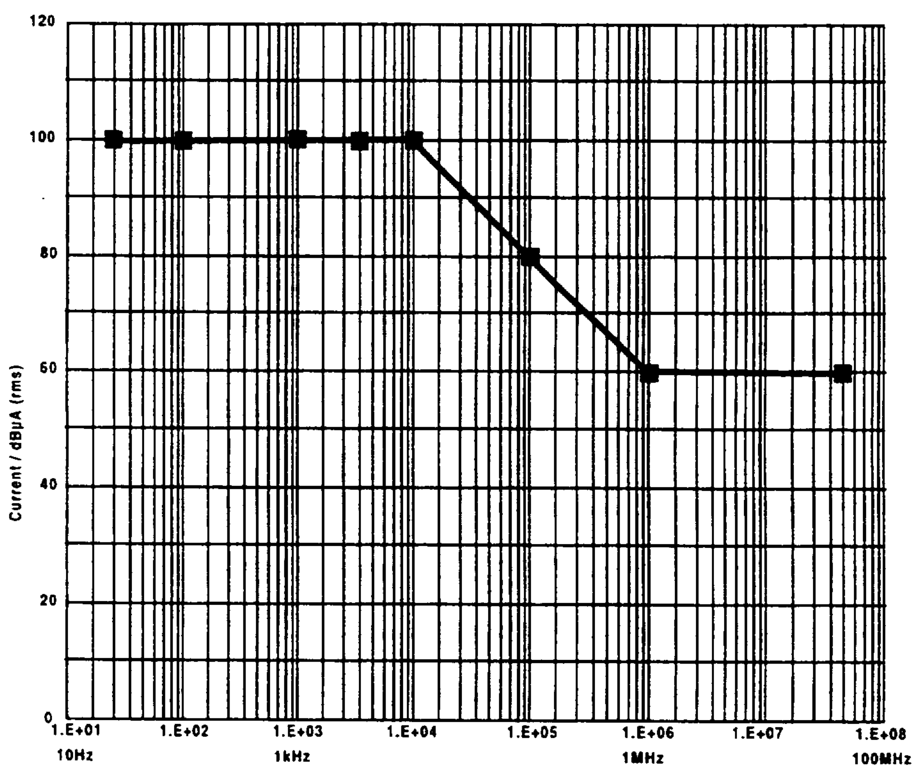
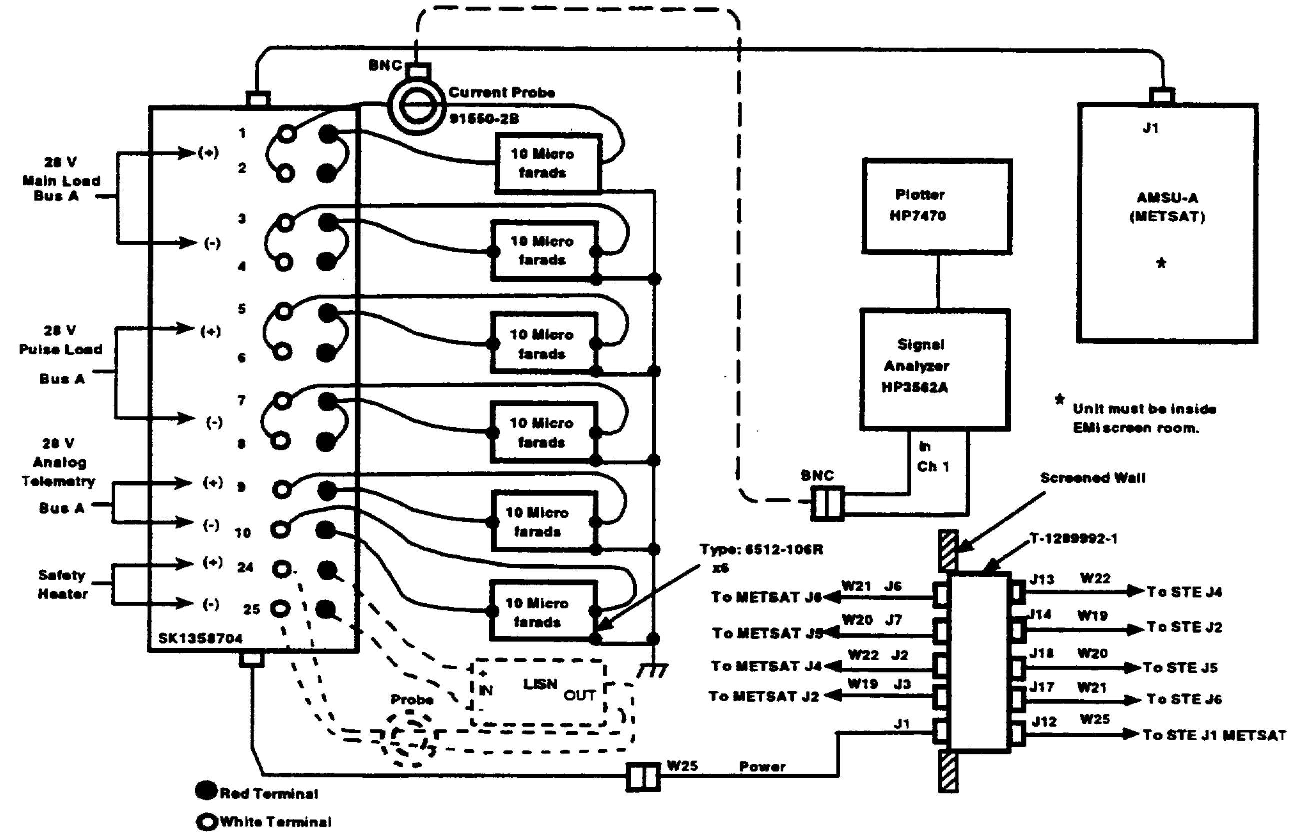


Figure 4. Conducted Emission Limit, NB, DM, Thermal Control Heaters (Safety Heater)



1. Feedthrough capacitor.
2. Bond to ground plane
3. Test sample situated in test fixture, 10 cm from front edge of ground plane.
4. Bond to test fixture as defined.
5. Filtered power supply terminals at screened enclosure wall.
6. Test sample interconnecting lead. Length as defined in the installation specification.
7. Power leads emulating the spacecraft configuration.
8. Interconnecting lead to monitoring equipment/test set via port-hole.
9. Test fixture DC bond to screened enclosure wall or ground plane shall be less than 2.5 milliohms.
10. Current probe connected to receiver via coaxial cable.

Figure 5a. CE01/CE03 Test Setup (Differential Mode)

4. Calibrate the receiving test equipment.

5. Before starting test, place the AMSU-A instrument in the IN ORBIT mode.

3.4.5.3.2 *Emission measurement, 30 Hz to 20 kHz (CM & DM) - CE01*

1. Place the 91550-1 current probe on one of the power lines listed in 3.4.4.2a or Table A-III of Appendix A, as applicable.

2. Verify that the measuring equipment is programmed to measure between 30Hz and 20 kHz. If necessary, program the signal analyzer for multi-scan and compare the measurement to the signal scan. Capture the highest level possible in each range.

3. Using the spectrum analyzer, automatically scan all narrowband data in the frequency range.

4. Photograph the cathode ray tube (CRT) presentation or make an X-Y plot. All narrowband measured data should be below the specification limit of Figures 2, 3, and 4. Record compliance with emission limits requirements on TDS 1. Set the computer to print the measured level of the signals above 30 dB above 1μV for reference.

5. Confirm all over limit levels by direct substitution. If any emissions exceed or near the limit, scan the frequency range that exhibits the over-the-limit levels, reduce the frequency span, reduce the measuring bandwidth to 5 or 500 Hz, and photograph the CRT presentation or make an X-Y plot.

6. Affix the test photos and calculations to TDS 1.

7. Repeat Steps 1 through 6 for all the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

8. If any narrowband signals exceed the limits, perform an ambient test.

9. With the STE Main Power off, turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until the knob stops turning.

10. Connect the equipment as shown in Figure 5b. Place switches 1 through 10 and 14 through 25 in the OPEN position.

11. Turn the STE Main Power switch to ON, and turn the Q/Main and N/Pulse switches (green switches) on the STE Main Front Panel, to ON.

12. Gradually increase the Q/Bus voltage on the STE Power Supply to the 28 V level as monitored by the DVM (see Figure 5b).

13. Repeat steps 1 through 6 and 8 of this section.

14. Command the instrument power to OFF. Turn off the Main Power switch on the STE, and turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until it stops turning.

15. Place the current probe and the LISN on the next power line indicated in 3.4.4.2a, or Table A-III of Appendix A, or both. Repeat steps 11 and 12.

16. Repeat steps 13 through 15 until the test is completed.

17. Change the setup configuration as depicted in Figure 5c. Place switches 12, 13, 24, and 25 to the OPEN position.

18. Connect the current probe on the +10 V Interface Line, as shown in Figure 5c.

19. Repeat steps 2 through 6 and step 8 of paragraph 3.4.5.3.2.

20. Move the current probe to the line of Terminal 13 (white terminal).

21. Repeat step 19.

22. Connect the current probe as depicted in Figure 5d.

23. Repeat step 19.

3.4.5.3.3 ***Emission measurement, 20 kHz to 50 MHz (CM & DM) - CE03***

1. Connect the equipment as shown in Figure 5a. Apply power to the test equipment and special test equipment (STE) and place the instrument in full scan mode. Place the 91550-1 current probe on one of the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

2. Verify that the measuring equipment is programmed to measure between 30 Hz to 20 kHz or 20 kHz to 50 MHz, or both.

3. Using the spectrum analyzer, automatically scan all narrowband data in the frequency range. Print the CRT presentation.

4. Photograph the cathode ray tube (CRT) presentation or make an X-Y plot. All narrowband measured data should be below the specification limit of Figures 2, 3, and 4. Record compliance with emission limits requirements on TDS 1. Set the computer to print the measured level of the signals above 30 dB above 1μV for reference.

5. Confirm all over limit levels by direct substitution. If any emissions exceed or near the limit, scan the frequency range that exhibits the over-the-limit levels, reduce the frequency span, reduce the measuring bandwidth to 5 or 500 Hz, and photograph the CRT presentation or make an X-Y plot.

6. Affix the test photos and calculations to TDS 1.

7. Repeat Steps 1 through 6 for all the power lines listed in 3.4.4.2.a, or Table A-III of Appendix A, or both.

8. If any narrowband signal exceeds the limits, perform an ambient test.

9. With the STE Main Power off, turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until the knob stops turning.

10. Connect the equipment as shown in Figure 5b. Place switches 1 through 10 and 14 through 25 in the OPEN position.

11. Turn the STE Main Power switch to ON, and turn the Q/Main and N/Pulse switches (green switches) on the STE Main Front Panel to ON.

12. Gradually increase the Q/Bus voltage on the STE Power Supply to the 28 V level as monitored by the DVM (see Figure 5b).

13. Repeat steps 1 through 6 and 8 of this section.

14. Command the instrument power to OFF. Turn off the Main Power switch on the STE, and turn the Q/Bus Power Supply voltage knob on the STE counterclockwise until it stops turning.

15. Place the current probe and the LISN on the next power line indicated in 3.4.4.2a, or Table A-III of Appendix A, or both. Repeat steps 11 and 12.

16. Repeat steps 13 through 15 until the test is completed.

17. Change the setup configuration as depicted in Figure 5c. Place switches 12, 13, 24, and 25 to the OPEN position.

18. Connect the current probe on the +10 V Interface Line, as shown in Figure 5c.

19. Repeat steps 2 through 6 and step 8 of paragraph 3.4.5.3.3.

20. Move the current probe to the line of Terminal 13 (white terminal).

21. Repeat step 19.

22. Connect the current probe as depicted in Figure 5d.

23. Repeat step 19.

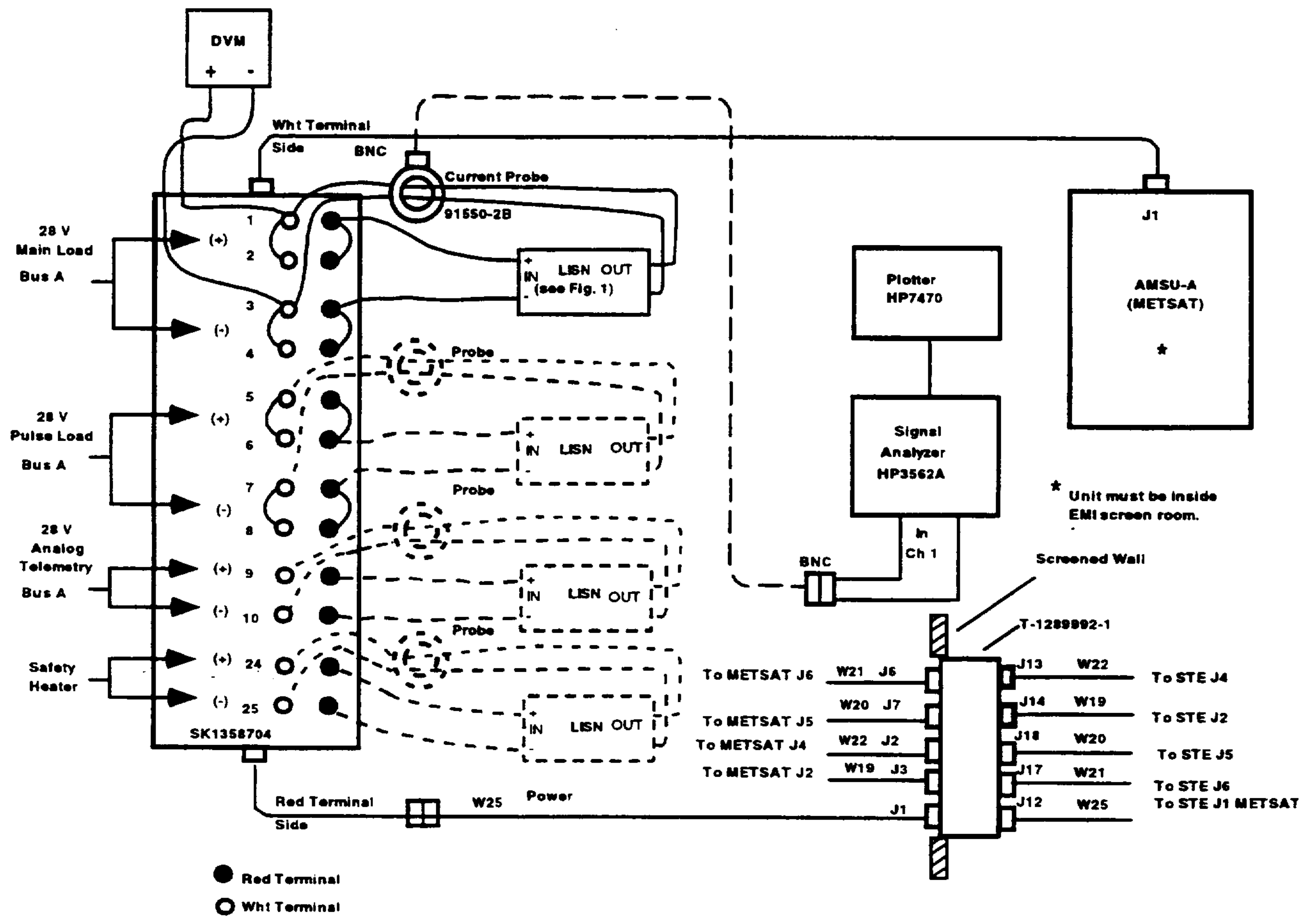


Figure 5b. CE01/CE03 Test Setup (Common Mode)

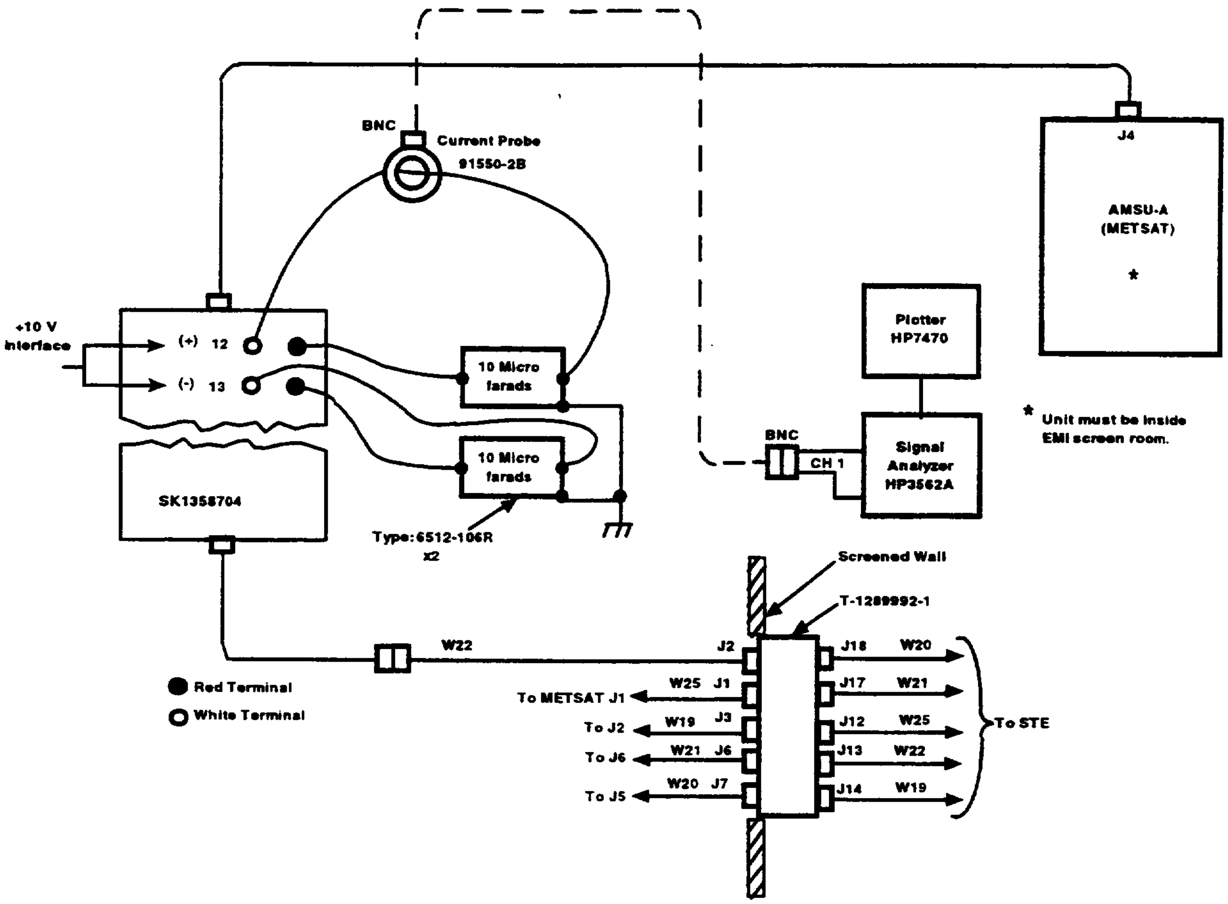


Figure 5c. CE01/CE03 +10 V Interface Test Setup (Differential Mode)

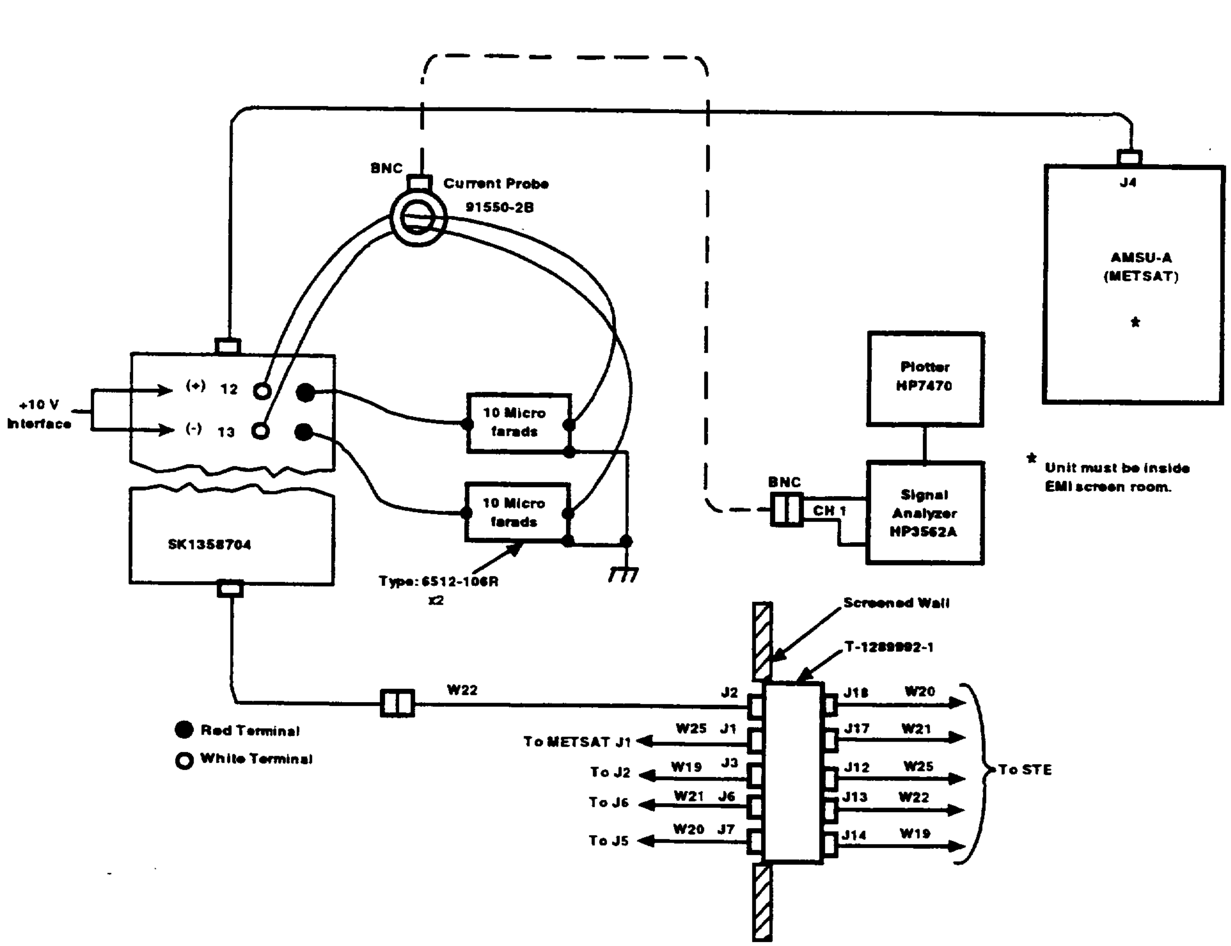


Figure 5d. CE01/CE03 +10 V Interface Test Setup (Common Mode)

3.4.6 ***RE02 test.*** This test shall measure the electric fields radiated from the AMSU equipment(s) over the frequency range of 14 kHz to 2 GHz to verify that the emissions are below the RE02 limit specified in MIL-STD-461C. In addition, the equipment will be tested for the emission of the following frequencies to verify either that the frequencies are not present or that their signal level does not exceed the test equipment sensitivity level listed for each frequency.

Frequency	Receiver/Ampl Sensitivity
59.458 MHz ±0.5 kHz	−60 dBm
60.10 MHz ±0.5 kHz	−60 dBm
141.360 MHz ±0.5 kHz	−60 dBm
142.9 MHz ±0.5 kHz	−60 dBm
282.733 MHz ±0.5 kHz	−60 dBm
285.813 MHz ±0.5 kHz	−60 dBm
371.921 MHz ±0.5 kHz	−60 dBm
375.972 MHz ±0.5 kHz	−60 dBm
624.925 MHz ±0.5 kHz	−60 dBm
631.730 MHz ±0.5 kHz	−60 dBm
743.841 MHz ±0.5 kHz	−60 dBm
751.944 MHz ±0.5 kHz	−60 dBm
121.5 MHz ±15 kHz *	−150 dBm (Bandwidth 100 Hz)
243 MHz ±25 kHz *	−150 dBm (Bandwidth 100 Hz)
401.650 MHz±50 kHz *	−150 dBm (Bandwidth 100 Hz)
406.05 MHz±50 kHz *	−150 dBm (Bandwidth 100 Hz)
2010-2040 MHz	−120 dBm

* METOP replaces these frequencies with the frequencies in Table IV.

3.4.6.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Computer Controller System, Spectrum Analyzer, HP 8566, or equivalent

b. Amplifier, HP 8447F, or equivalent

c. Feedthrough Capacitors, Solar 6512-106R

d. Antenna, Active Rod, EMCO 3301B with Counterpoise, 14 kHz to 30 MHz

e. Antenna, Biconical, Electro-Metrics BIA25, 20 to 200 MHz

f. Antenna, Log Spiral, Electro-Metrics LCA25, 200 MHz to 1 GHz

Table IV. SARR, SARP, and DCS Receiver Channel Guard Limits

Frequency Range (MHz)	Radiation Limit (dBm)	E-Field Limit * (dB µV/m)	Notes
118.00-120.00	-100	18.9	121.5 MHz
120.00-121.450	-125	-6	121.5 MHz
121.450-121.485	-145	-26	121.5 MHz
121.485-121.515	-150	-31	121.5 MHz
121.515-121.550	-145	-26	121.5 MHz
121.550-123.000	-125	-5.9	121.5 MHz
123.000-125.000	-100	19.2	121.5 MHz
236.000-240.000	-100	24.9	243.0 MHz
240.000-242.925	-125	0	243.0 MHz
242.925-242.975	-145	-20	243.0 MHz
242.975-243.025	-150	-25	243.0 MHz
243.025-243.075	-145	-20	243.0 MHz
243.075-246.000	-125	0.1	243.0 MHz
246.000-250.000	-100	25.3	243.0 MHz
385.100-401.100	-100	29.4	406.05 MHz
401.100-405.900	-125	4.5	406.05 MHz
405.900-406.000	-145	-15.5	406.05 MHz
406.000-406.100	-150	-20.5	406.05 MHz
406.100-406.200	-145	-15.5	406.05 MHz
406.200-411.000	-125	4.6	406.05 MHz
411.000-425.000	-100	29.9	406.05 MHz
396.000-401.500	-125	4.4	401.65 MHz
401.500-401.600	-145	-15.6	401.65 MHz
401.600-401.700	-150	-20.6	401.65 MHz
401.700-401.800	-145	-15.6	401.65 MHz
401.800-406.000	-125	4.5	401.65 MHz

* E-field limits have been calculated by METOP and are for reference only. The following formula has been applied for translating Power levels to Field strength levels.

$$E[dB\mu V/m] = P[dBm] - Gr[dBi] + 20log(\mathrm{f[Hz]}) - 42.7$$

where P is the received power, Gr is the gain of the receiving antenna and f is the frequency. Note that Gr has arbitrarily been set to 0 dB (isotropic) in calculating the above levels. E-field limits would have to be adjusted to reflect actual test antenna characteristics.

g. Antenna, Double-Ridged Guide Antenna, Electro-Metrics RG180, 1-18 GHz

h. Signal Analyzer, HP 71210C with HP 70620 Series Preamplifier

i. Amplifier, HP 461A, or equivalent

j. Computer, HP 9836

k. Printer, HP 2673A

l. Plotter, HP 7090A

m. Filter box, Aerojet, T-1289992-1.

3.4.6.2 *Limits*

3.4.6.2.1 ***Allowable limits.*** The limits of the emissions shall conform to the requirements of MIL-STD-461C. The limits are shown in Figures 6 and 7 Measurements shall be made over the frequency range from 20 kHz to 1 GHz for broadband emissions and from 14 kHz to 2 GHz for narrowband emissions. The appropriate antenna and other pertinent factors are automatically included in the computer EMI test routines. The METOP instrument shall meet the electric field radiated emissions as shown in Figure 8. The limits provided in Figure 8 are for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.6.3 *Test procedure*

3.4.6.3.1 *Preparations*

1. Connect the test equipment as shown in Figure 9 with the antenna in front of either of the two units (A1 or A2), one meter away at the point of maximum interference. Fill in Equipment Log on TDS 2.

NOTE

In order to reduce ambient emissions or obtain a profile of the electric-field ambient emission spectrum, or both, and at the discretion of the test engineer, the test set can be positioned inside the test enclosure. The interconnecting cables shall be shielded or placed inside a shielded box to reduce cable length and radiations.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3.4.6.3.2 *Test steps*

1. Connect the antenna to the appropriate amplifier to the receiver equipment. Verify that the AMSU interface cables used for monitoring are shielded.

2. Perform the system calibration of the HP8566 spectrum analyzer.

3. Using the HP8566, automatically scan all narrowband data from 14 kHz to 1 GHz, switching the appropriate antenna and amplifier throughout the frequency range. Set the computer to print the CRT presentation with limits.

4. All data should be below the specification limit of Figure 6. Record compliance with emission limit requirements on TDS 2. If any emissions are observed to exceed the limit line, set the computer to print the measured levels.

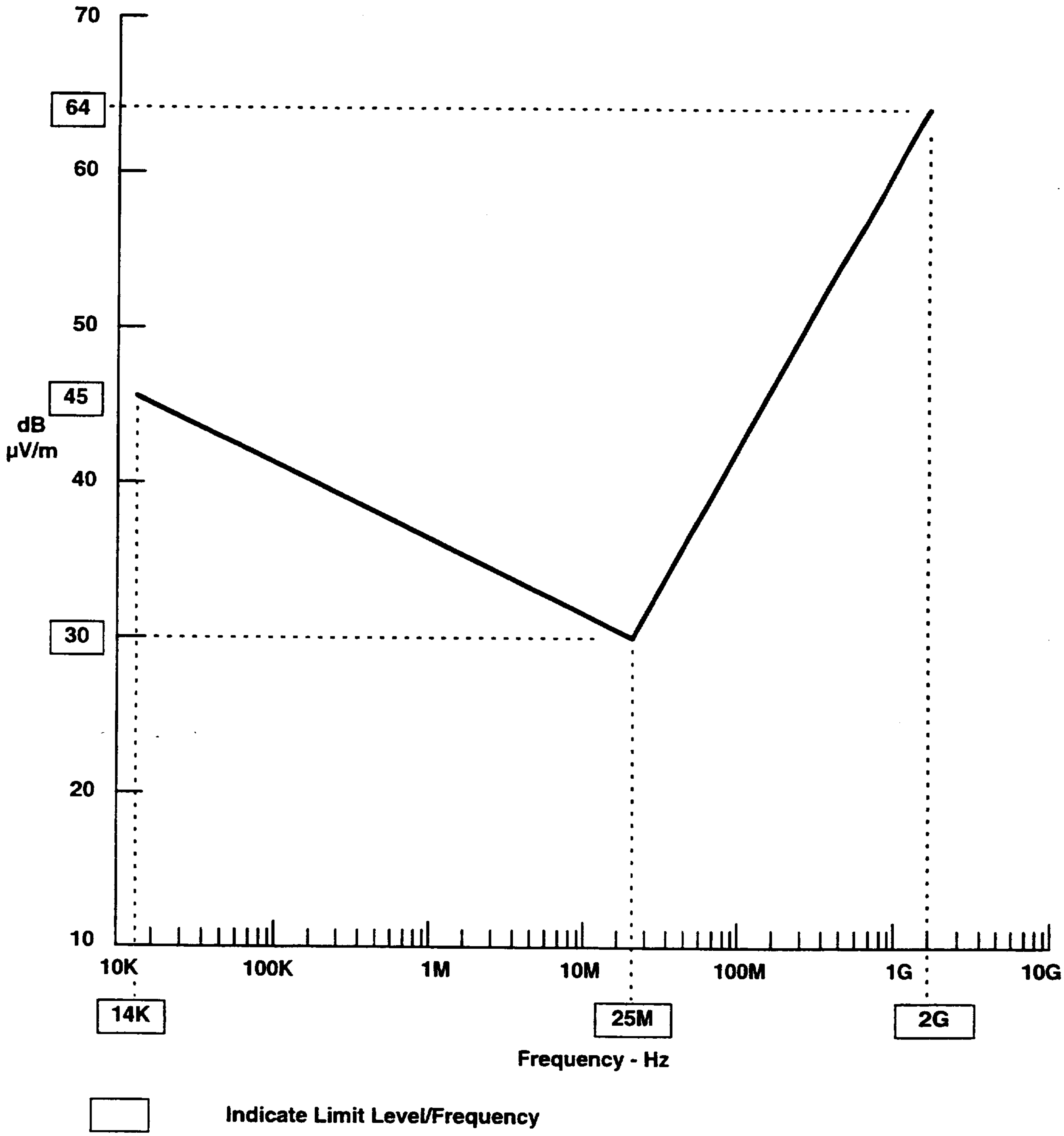


Figure 6. Radiated Narrowband Limits for Electric-Field Emission Produced by Instrument

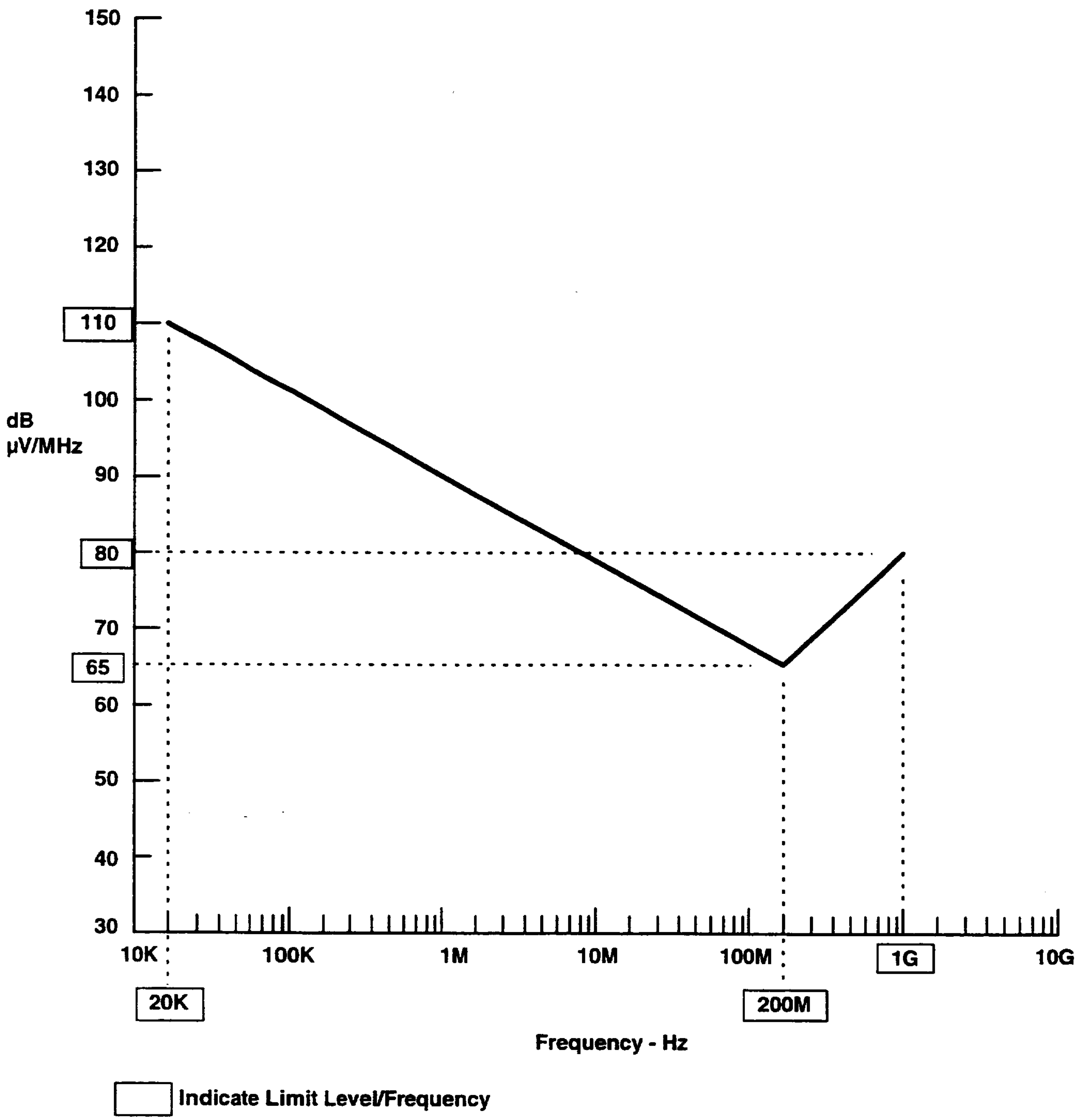
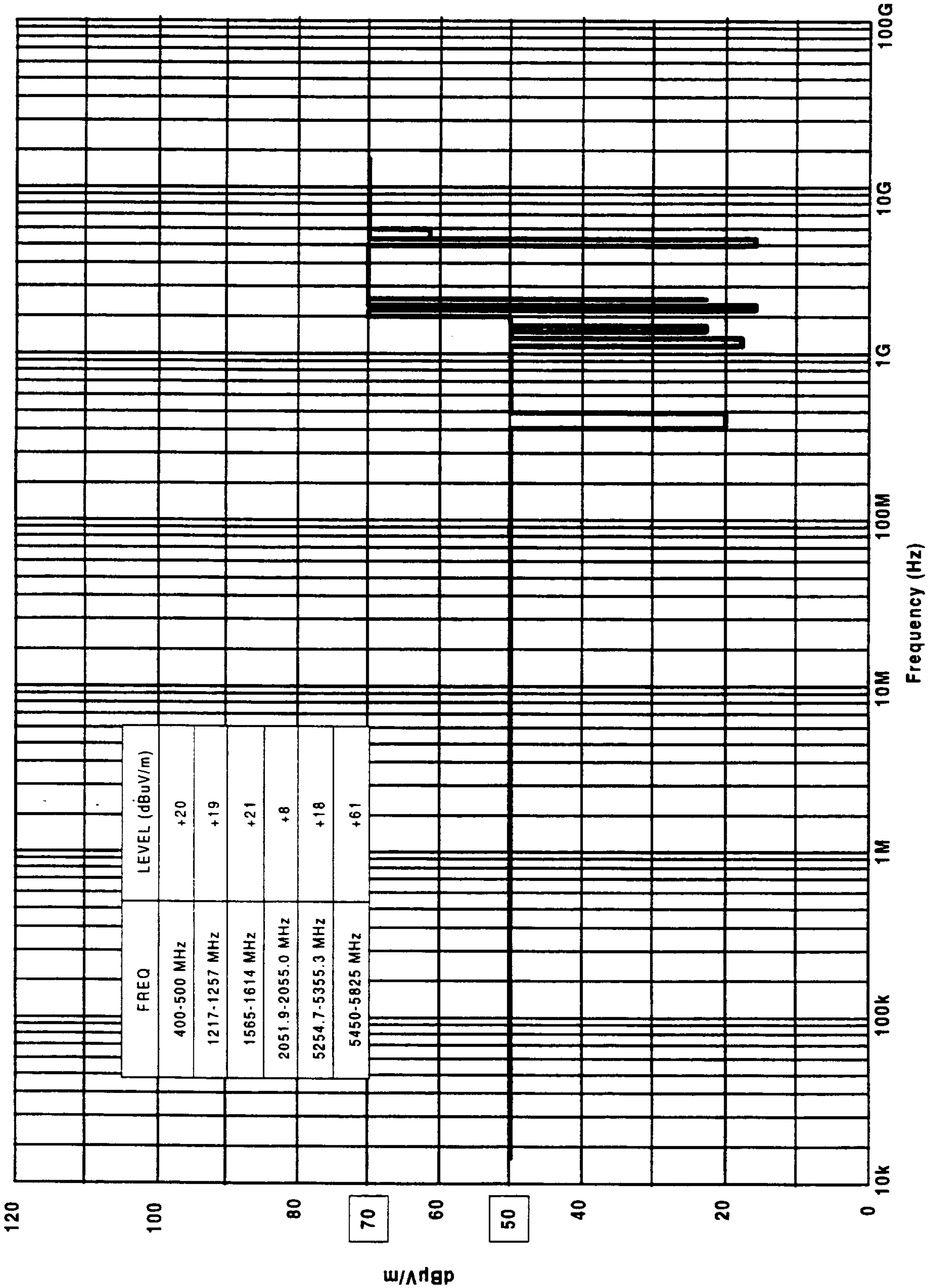
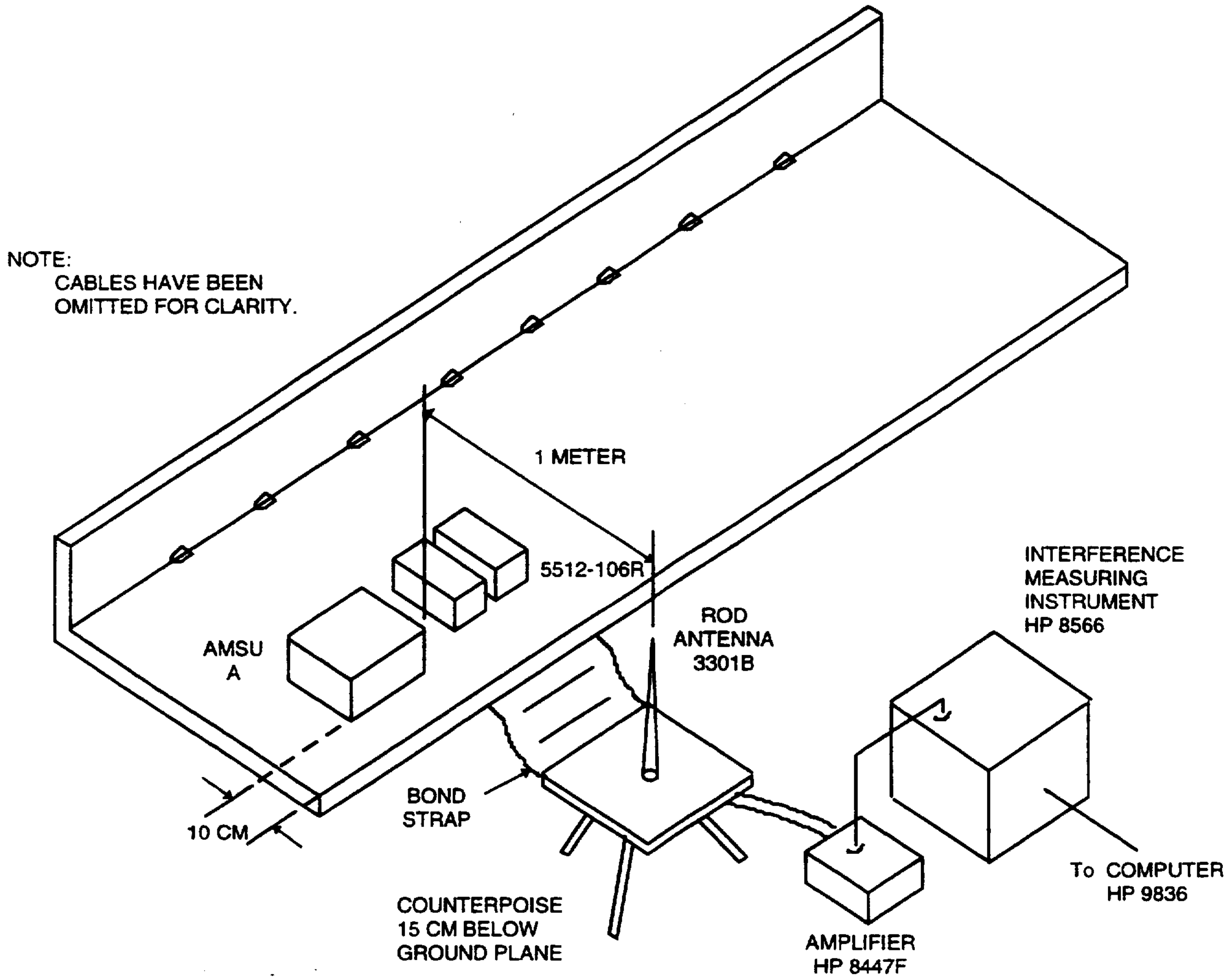


Figure 7. Radiated Broadband Limits for Electric-Field Emissions Produced by Instrument



FREQ	LEVEL (dBuV/m)
400-500 MHz	+20
1217-1257 MHz	+19
1565-1614 MHz	+21
2051.9-2055.0 MHz	+8
5254.7-5355.3 MHz	+18
5450-5825 MHz	+61

Figure 8. Radiated Narrowband Limits for Electric Field Emissions METOP Only



14 kHz to 10 GHz Antennas

Manufacturer	Model	Frequency Range
EMCO	3301B Rod	14 KHz - 30 MHz
Electro-Metrics	BIA-25 Biconical	20 MHz - 200 MHz
Electro-Metrics	LCA-25 Log Conical	200 MHz - 1 GHz
Electro-Metrics	RG-180 Horn	1 GHz - 18 GHz

Figure 9. RE02 Test Setup

5. Request all broadband data from 14 kHz to 1GHz from the computer. Plot the CRT presentation with limits.

6. All data should be below the specification limit of Figure 7. Record compliance with emission limit requirements on TDS 2. If any emissions are observed to exceed the limit line, set the computer to print the measured levels and perform ambient radiated emission tests to determine the source of the radiated emission as indicated in Step 7.

7. Turn off power to the AMSU-A power supplies. Perform a frequency scan throughout the frequency range that exceeded the limits. Turn off power to the computer, display, and printer and repeat the frequency scan through the previously tested frequency range. Print all measured ambient levels.

8. Frequencies detected to be generated from the test set components or generated by outside sources, or both, will be compared with emissions radiating from the AMSU-A equipment. Ambient frequencies will be deleted from the radiated emission of the AMSU-A equipment, as being generated outside the unit under test. The remaining frequencies should be below the specification limits.

9. Set up the double-ridged guide horn antenna one meter from the point of maximum radiation.

10. Calibrate the spectrum analyzer, HP8566.

11. Sweep throughout the frequency range of 1 GHz to 2 GHz recording the observed narrowband emission levels.

12. All data should be below the specification limit of Figure 6. Record compliance on TDS 2.

13. Repeat Steps 3 through 12 with the instrument isolated from the ground plane.

14. Activate the HP 70620 with the series amplifier. Program the analyzer for noise averaging to a minimum of eight times. Verify that the sensitivity noise level is at or below the required dBm level indicated in the list of additional discrete frequencies.

15. Connect the equipment of Step 14 to the biconical antenna and measure level at 121.5 MHz. Record on TDS 2.

16. Connect the equipment to the log conical antenna and measure level at 243 MHz, 401.65 MHz, and 406.05 MHz. Record on TDS 2.

17. The measurements of Steps 15 and 16 should be at ambient level and no narrowband frequencies above the maximum level should be detected at those frequencies.

18. Program the signal analyzer for the frequency range of 2010 to 2040 MHz. Verify that the sensitivity of the equipment meets -120 dBm throughout the 2010 to 2040 MHz range.

19. Connect the equipment of Step 18 to a double-ridged horn antenna and record the levels at the frequency range and specific frequency described in Step 18. Record on TDS 2.

20. The measurements of Step 19 should be at ambient level and no narrowband frequencies should be detected at the specified frequencies.

21. Repeat Steps 15 and 16 without the amplifier and perform a measurement of the remaining frequencies on the list of additional frequencies in paragraph 3.4.6 and Figure 8. Record on TDS 2.

22. Connect the equipment to the biconical antenna and measure the SAR frequency levels at 118.0 - 121.4 MHz and 121.5 - 125.0 MHz. Record on TDS 2.

23. Connect the equipment to the log spiral antenna and measure the SAR frequency levels specified on TDS 2, starting with the 236.0 - 240.0 MHz frequency range. Record results on TDS 2.

3.4.7 ***RE04 test.*** This test is performed to determine the level of magnetic radiation at a distance of 1 meter from the AMSU-A instrument as specified in paragraph 3.5.2 of IS-3267415.

3.4.7.1 ***Test equipment.*** The following equipment or equivalent is required for this test:

a. Gauss Meter Model 9901 with Magna Probe BEL-MOX-99-2506, FW Bell (rental), or Analog Voltmeter, HP 4288, with 3529A Magnetometer Probe.

3.4.7.2 ***Test limits.*** The AMSU instrument shall not generate magnetic fields that exceed 100 gamma (1 milligauss) at a distance of one meter from the center of the instrument in all directions. The METOP requirement shall not generate magnetic fields that exceed 130 kgamma (1.3 gauss) at a distance of one meter from the center of the instrument in all directions. The limit for METOP is for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.7.3 ***Test procedure***

3.4.7.3.1 ***Preparations (magnetic field)***

1. Place the AMSU instrument in an area that provides sufficient earth magnetic field cancellation that the ambient of 1 milligauss one meter from the center of the test area is obtainable (see Figure 10).

2. Allow the gauss meter to warm up properly and calibrate the meter. Fill in equipment log on TDS 3.

3. Direct the gauss meter probe toward the area that produces the lowest gauss level measurement, below the limit and at approximately at mid height of the instrument under test.

3.4.7.3.2 ***Test steps***

1. Move the AMSU instrument, on the wooden fixture, toward the probe to a distance of one meter from the center of the instrument to the point of the probe.

2. Rotate the instrument until the connector side is facing the probe.

3. Measure the magnetic field emissions of the AMSU instrument with the unit deactivated. Collect test data of the magnetic field intensity by rotating the equipment clockwise and taking measurements at 30 degree intervals, as a minimum. Record results and note level and location on TDS 3.

4. At the points of maximum detection, repeat measurements with the instrument activated and operating in the IN ORBIT mode. Note difference in level. If levels exceed previous measurement levels, repeat Step 2 with the unit activated.

5. Review recorded data. If measurements are within the 100 gammas (1 milligauss) at one meter from the instrument in all directions, the test is completed. If measurements exceed the limit, measure the ambient and proceed to Step 6 or Step 7.

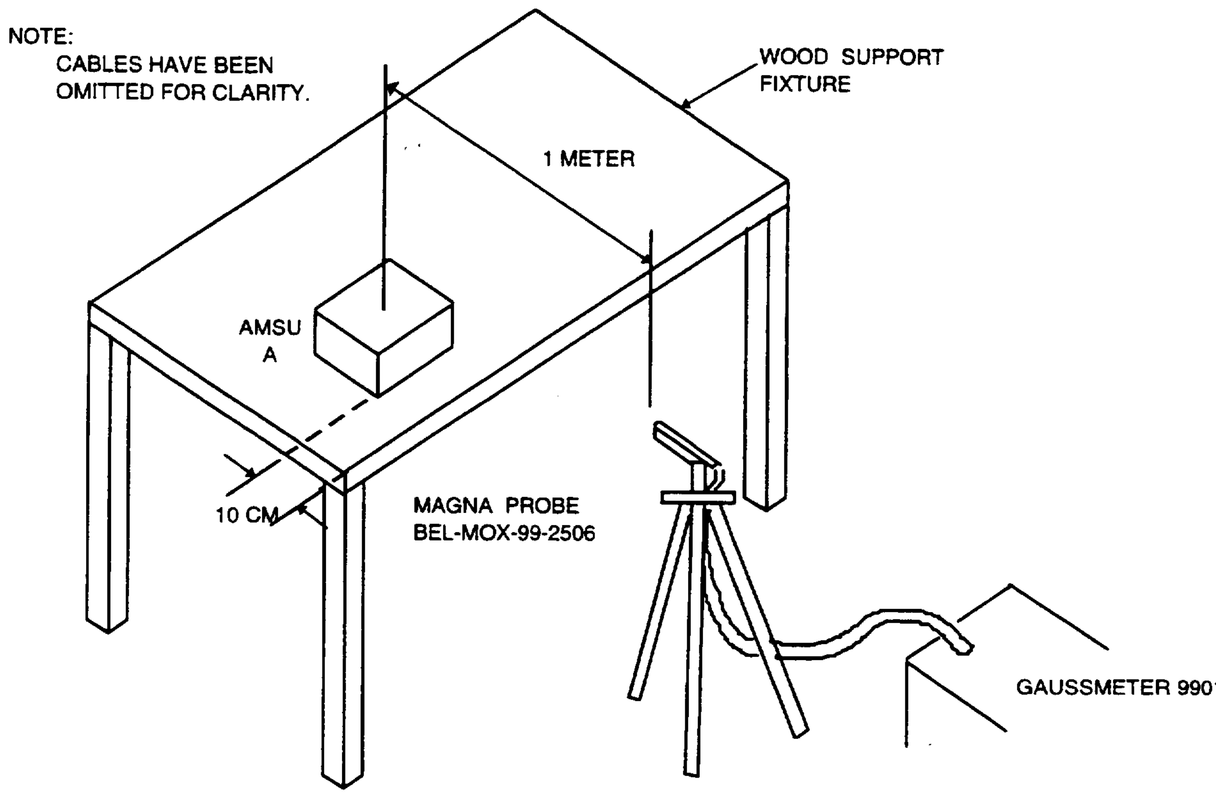


Figure 10. RE04 Test Setup

NOTE

Measurements that exceed the 1 milligauss limit because the interconnecting cable reduces the distance between the test probe and the UUT are exempted from this requirement. (Waiver/Deviation Request/Approval, D016.)

6. In the event that the ambient level does not meet the requirement and the ambient cannot be reduced further due to facility or area limitations, a minimum of three correlatable measurements shall be made in the axis of maximum field intensity but at a shorter distance than 1 meter. The measured levels shall be able to provide an approximate field intensity when projected to the 1-meter distance requirement. Measurements and calculations of the ambient magnetic field shall be recorded and shall be part of the test data package.

7. In the event that the measured level exceeds the one milligauss required level, the measurements shall be made to determine the location of the center of the magnetic dipole moment producing the out-of-limit condition. A minimum of three correlatable measurements along an axis are required to plot the magnetic field.

8. Record all measured data, indicating level and position of the probe. Note opposing magnetic dipole moments, shield leakage, and all other pertinent data.

9. Repeat measurement within ten inches above and below the mid-height probe placement of 3.4.7.3.1 (3).

3.4.8 ***CS01/CS02 test.*** This test shall be used to determine if the AMSU system is susceptible to electromagnetic energy in the frequency range of 30 Hz to 150 kHz injected in the main power leads. The instrument shall be operated in the IN ORBIT mode. In addition, the METOP shall meet susceptible energy in the frequency range of 100 kHz to 50 MHz.

3.4.8.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Isolation Transformer, Solar Type 6220-1A

b. Amplifier, McIntosh Model MC-2205

c. Oscilloscope, Tektronix 7623

d. Signal Generator*, HP 83623A

e. Function Generator, HP 3325

f. Coupling Capacitor*, Solar 7415-1

g. Digital Voltmeter, HP 3455A.

h. Attenuators*, HP 355 C/D

i. Oscilloscope*, Tek TDS 380

j. Amplifiers*, Ailtech 5001, 5020B

k. Current Probe*, Ailtech 91550-2B

l. Spectrum Analyzer*, HP 8566

m. Decoupling Coil*, 20 μH

n. LISN* per Figure 1

o. Filter box, Aerojet, T-1289992-1.

3.4.8.2 ***Test limits.*** The performance characteristics of the AMSU instrument shall be met when the voltage of Figure 11 in the frequency range of 30 Hz to 150 kHz is applied to the input power terminals. The METOP shall be subject to a common mode sinusoidal noise of 300 mVp-p in the frequency range of 100 kHz to 50 MHz. The limit for METOP is for information only. Data will be recorded but will not be compared against the limits. There is no pass/fail requirement.

3.4.8.3 ***Test procedure***

3.4.8.3.1 ***Preparations***

1. Connect the test equipment as shown in Figure 12. Fill in Equipment Log on TDS 4.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3. Cognizant of the power line under test, perform the functional test for susceptibility as indicated in Table V.

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* For METOP Test step 10 only.

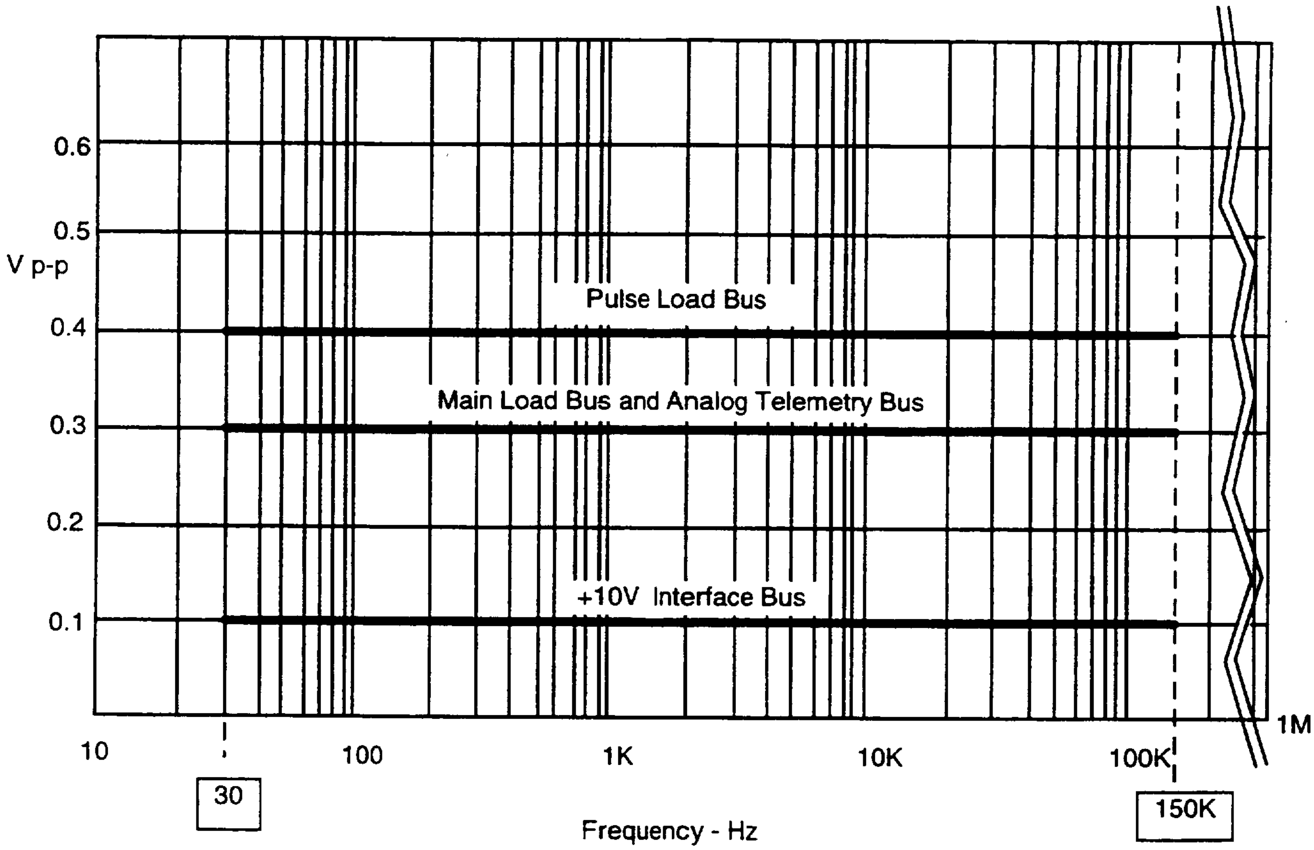
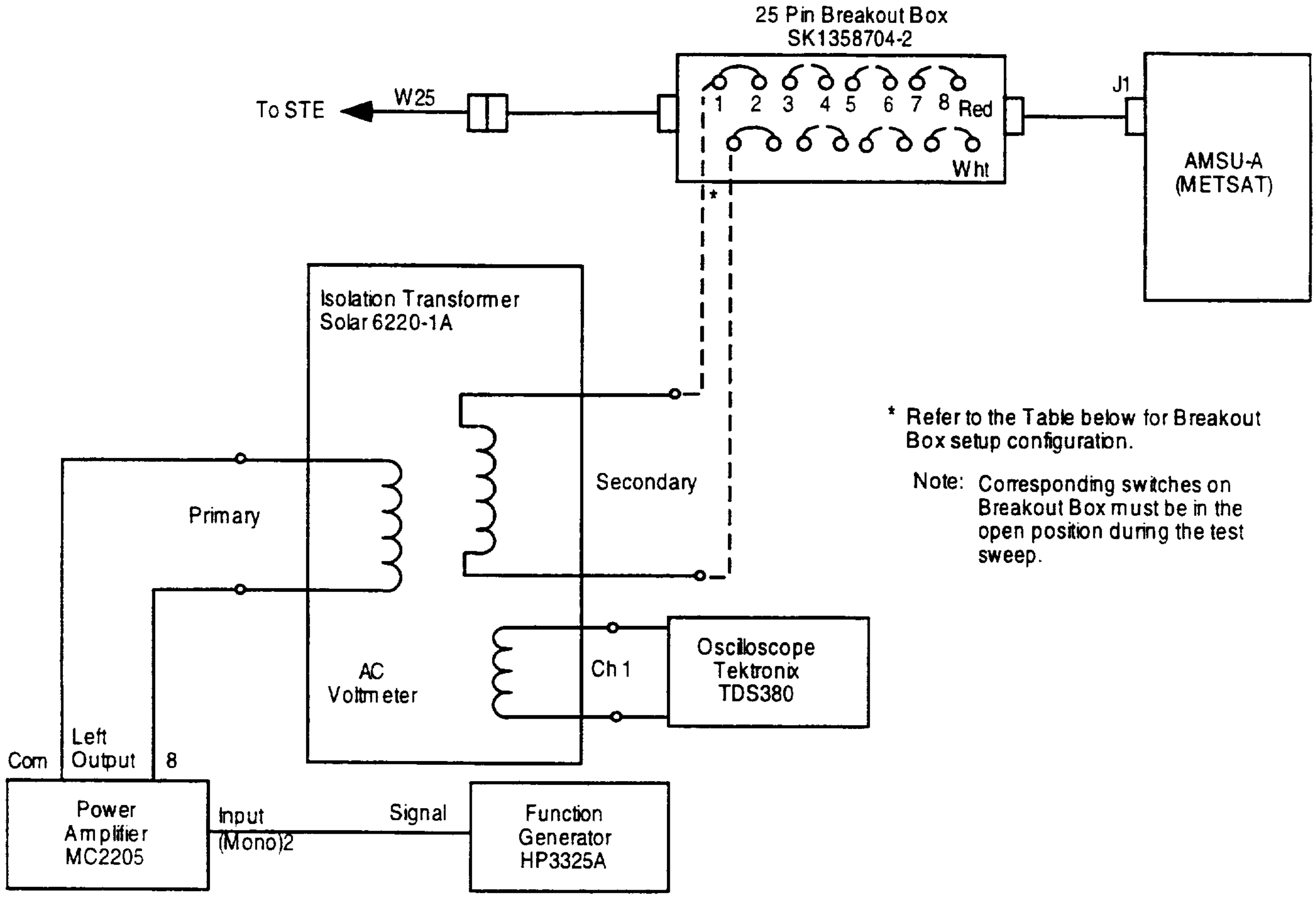


Figure 11. Ripple and Noise Susceptibility Limit



Test Type	Breakout Box Setup Configuration								Open Corresponding Switch
	B/O Box Terminal Jumpers				Transformer tp B/O Box Connection				
	From	Row Color	To	Row Color	From	Row Color	To	Row Color	
+28 V Main Load	1	Red	2	Red	1	Red	1	White	1, 2
	1	White	2	White					
28 V Main Load Rtn	3	Red	4	Red	3	Red	3	White	3, 4
	3	White	4	White					
+28 V Pulse Load	5	Red	6	Red	5	Red	5	White	5, 6
	5	White	6	White					
28 V Pulse Load Rtn	7	Red	8	Red	7	Red	7	White	7, 8
	7	White	8	White					
+28 V Analog Telemetry					9	Red	9	White	9
28 V Analog Telemetry Rtn					10	Red	10		10

Figure 12. CS01/CS02 Test Setup (Differential Mode)

Table V. Functional Test for Susceptibility

Power line Under Test	Specification	Test Type	Data Monitor Point
Main Load Bus	AE-26156/3 (A1) AE-26156/4 (A2)	Relative Radiometer NEΔT Measurements*	- -
Pulse Load Bus	AE-26156/3 (A1) AE-26156/4 (A2)	– –	Warm Calibrate** Warm Calibrate **
Analog Telemetry Bus	AE-26156/3 (A1) AE-26156/4 (A2)	– –	Full Print Data page 8 Full Print Data page 3
+10V Interface Bus	AE-26156/3 (A1) AE-26156/4 (A2)	Scanner Commands Verification (Step 1 only)	Scanner A1/A2 Power Scanner A2 Power

CAUTION

Do not connect the isolation transformer on the high side and return lines simultaneously, without loading the secondary winding of the transformer not used for test with a 1 ohm resistor.

3.4.8.3.2 *Test steps*

1. Apply power to all the test equipment except the power amplifier.

2. Set function generator to scan from 30 Hz to 150 kHz, with the following frequency ranges being swept at a rate of 90 seconds per range:

30 - 300 Hz	3.0 - 30.0 kHz
300 Hz - 3.0 kHz	30.0 - 150.0 kHz.

3. Set the scan mode to SINGLE Sweep.

4. Monitor the output signal with an oscilloscope and adjust the output level to the indicated voltage requirement.

5. Set the appropriate switches to the OFF position on the breakout box.

6. Apply power to the power amplifier and adjust the amplifier and generator levels to obtain levels on the display that are equal to or greater than the levels indicated in Figure 11.

7. Monitor the test sample for errors and at selected frequencies get a printout of the monitored channel's performance data.

8. Record on TDS 4 the completion of scanning of each function generator's tuning range. Record each frequency at which a failure occurs and the interference level threshold for failure.

9. Repeat Steps 5 through 8 on the power leads listed in 3.4.4.2.c, or Table A-III of Appendix A, or both.

10. The METOP instrument shall be connected as shown in Figure 13 or 14.

* One sample of room ambient NEΔT will be measured. Alternatively, distribution measurements are to be performed.
** From STE Digital A Data Command menu

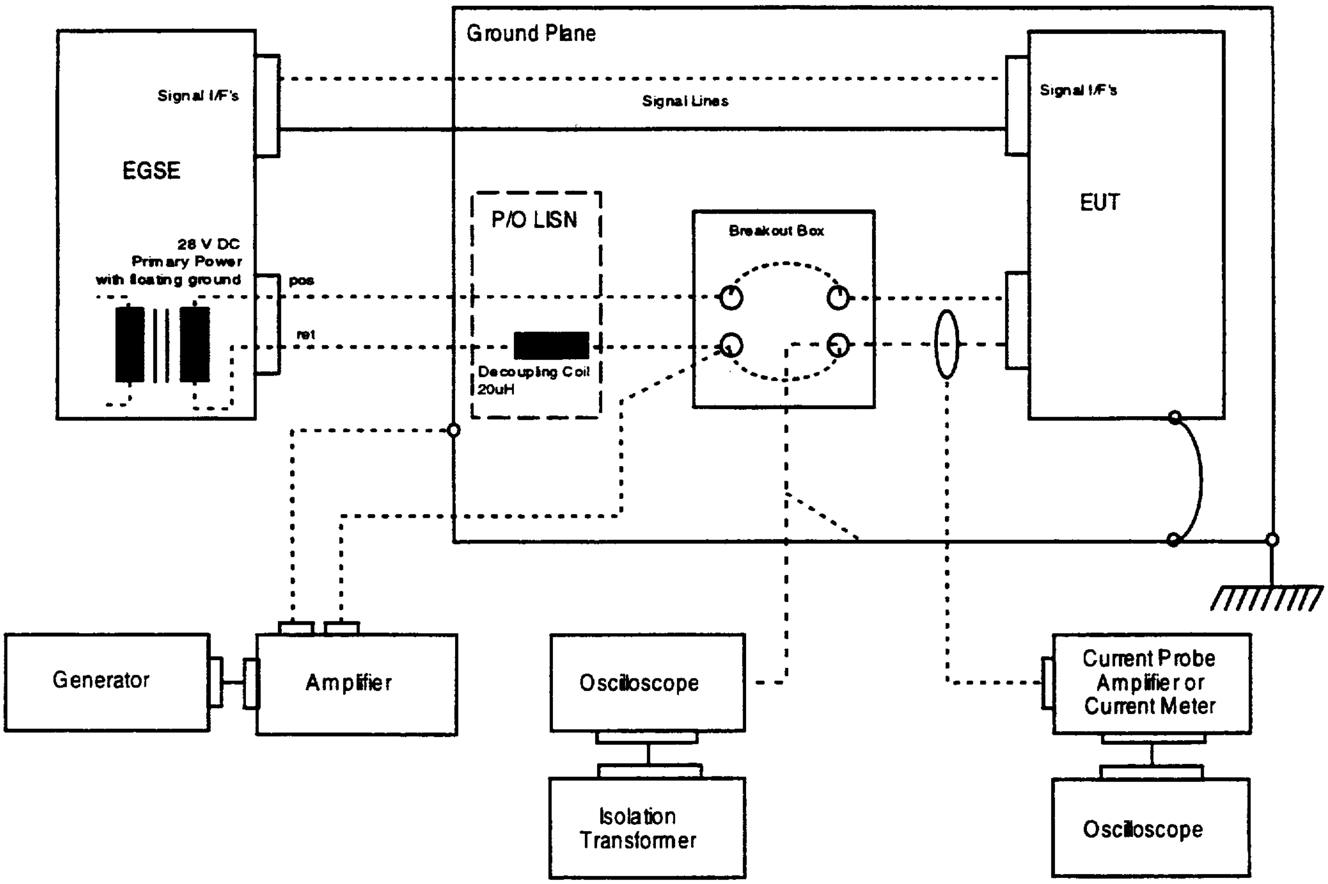


Figure 13. CS02 Common Mode Noise Test on the +28V Main Bus

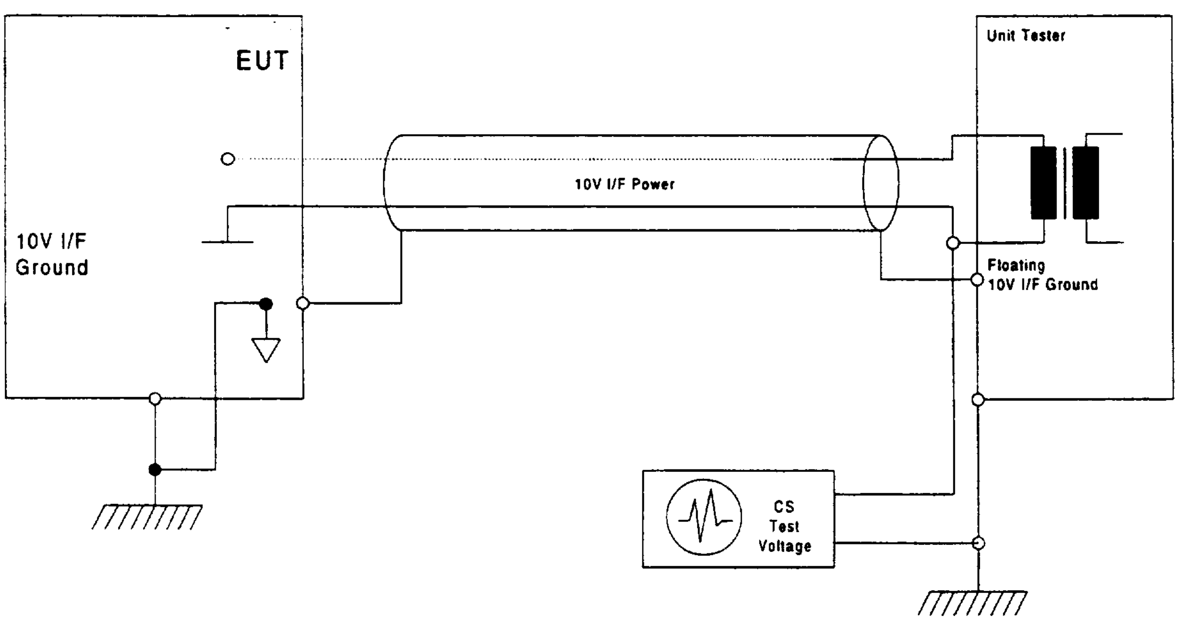


Figure 14. CS02 Common Mode Noise Test on the +10V Interface Bus

11. Apply the power to the test equipment.

12. Sweep the function generator from 100 kHz to 50 MHz in a minimum of five (6) frequency bands. Each frequency range shall be swept at a 90 second rate. Perform data collection test in accordance with Appendix C during the test sweep (obtain a baseline before starting the frequency scans, and ensure that the level is as low as possible).

13. Monitor the output signal with an appropriate meter and adjust the level as required. Record on TDS 5 the completion of scanning of each function generator and voltage level range.

14. Monitor the test sample for errors.

15. Record on TDS 5 the completion of each range and each frequency at which a failure occurs and the threshold level in case of a failure to meet the requirement.

3.4.9 ***CS06 test.*** This test shall be used to determine if the AMSU system is susceptible to electromagnetic energy from a spike appearing on its ungrounded power leads. The instrument shall be operated in the IN ORBIT mode.

3.4.9.1 ***Test equipment.*** The following equipment or equivalent (as defined in Table A-1) is required for this test:

a. Transient Generator, Solar 7054-1

b. 10 μF Feedthrough Capacitors, Solar 6512-106R. METOP will use LISN's as shown in Figure 1.

c. Oscilloscope, Tektronix 7623.

3.4.9.2 ***Test limits.*** No failures shall occur when the voltage waveform of Figure 15 is applied to the input power line, at the level and polarity indicated below:

Bus	Spike Level
+28V Main Bus	10V positive, 12V negative
+28V Telemetry Bus	10V positive, 12V negative
+28V Pulse Load Bus	8V positive, 13V negative
+10V Interface Bus	1V positive, 1V negative

3.4.9.3 ***Test procedure***

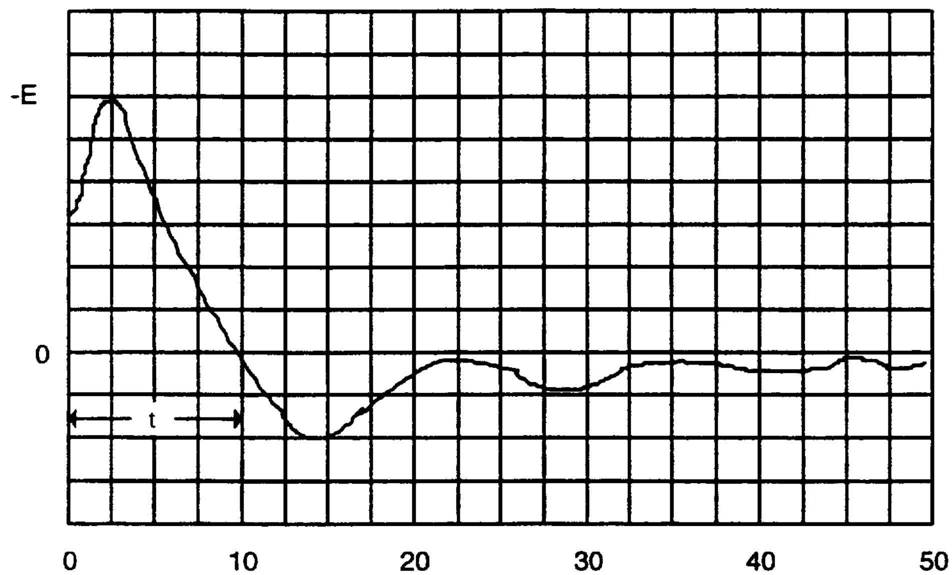
3.4.9.3.1 ***Preparations***

1. Adjust the generator to produce the spike of Figure 15 to the level specified in 3.4.9.2.

2. Connect the test equipment per Figure 16. Place switches 1 through 23 on the Breakout Box to the OPEN position. Fill in Equipment Log on TDS 6.

3. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

4. Cognizant of the power line under test, perform the functional test for susceptibility as indicated in Table III.



-E = AS SPECIFIED IN 3.4.9.2.
t = 10 MICROSECONDS.

Figure 15. CS06 Transient Waveform

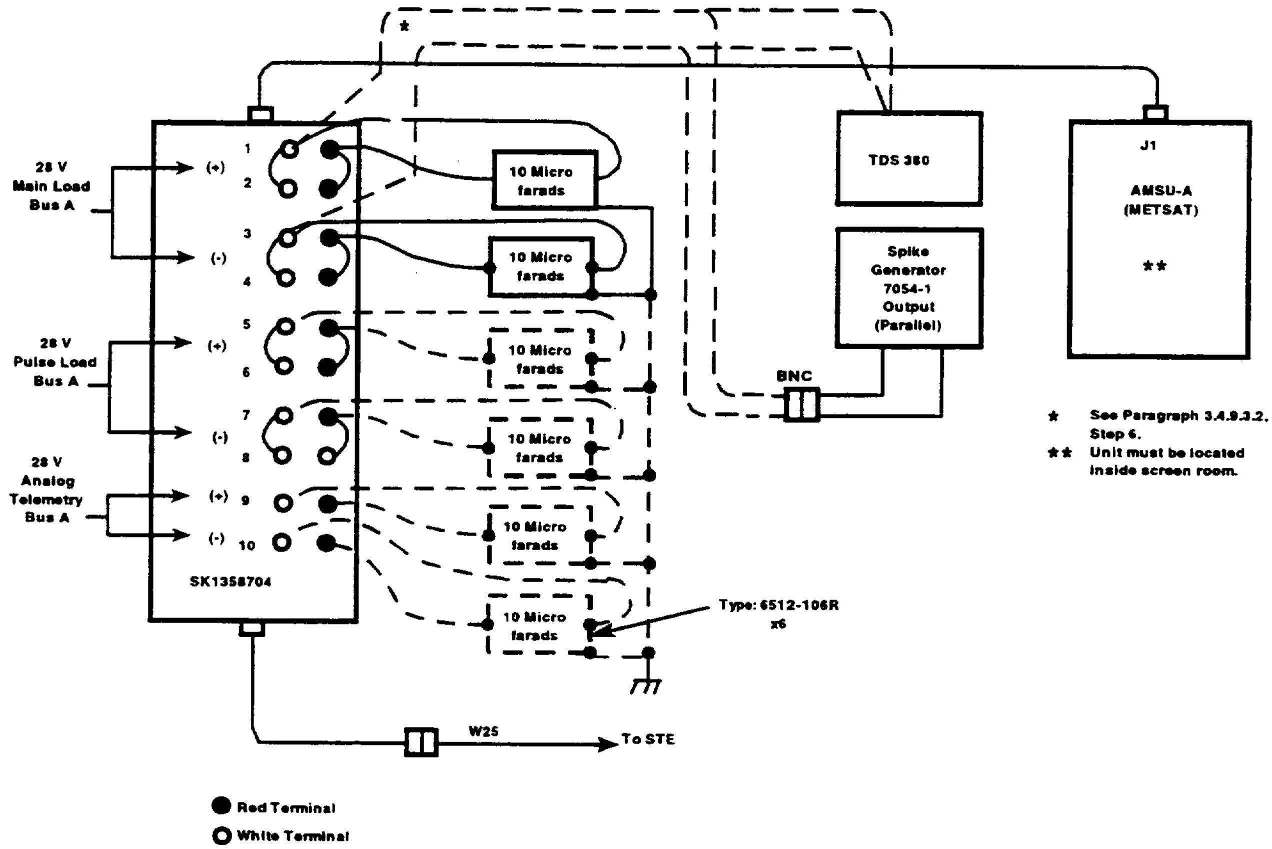


Figure 16a. CS06 Test Setup (Differential Mode)

3.4.9.3.2 *Test steps*

1. Apply the spike at a 10 pps rate for 5 minutes to the main power line.
2. Monitor the test sample for errors.
3. Reverse the spike polarity and level as indicated in 3.4.9.2. Repeat Steps 1 and 2.
4. Record the completion of each test on TDS 6. If failures occur, record the pulse amplitude and polarity.
5. Repeat Steps 1 through 4 on the main power return line.
6. Repeat Steps 1 through 4 on the other lines listed in 3.4.4.2.d or Table A-III of Appendix A, as applicable.
7. Configure the test equipment as shown in Figure 16b. Close all switches on the Breakout Box, leaving switches 12, 13, 24, and 25 in the OPEN position.
8. Repeat steps 1 through 4.

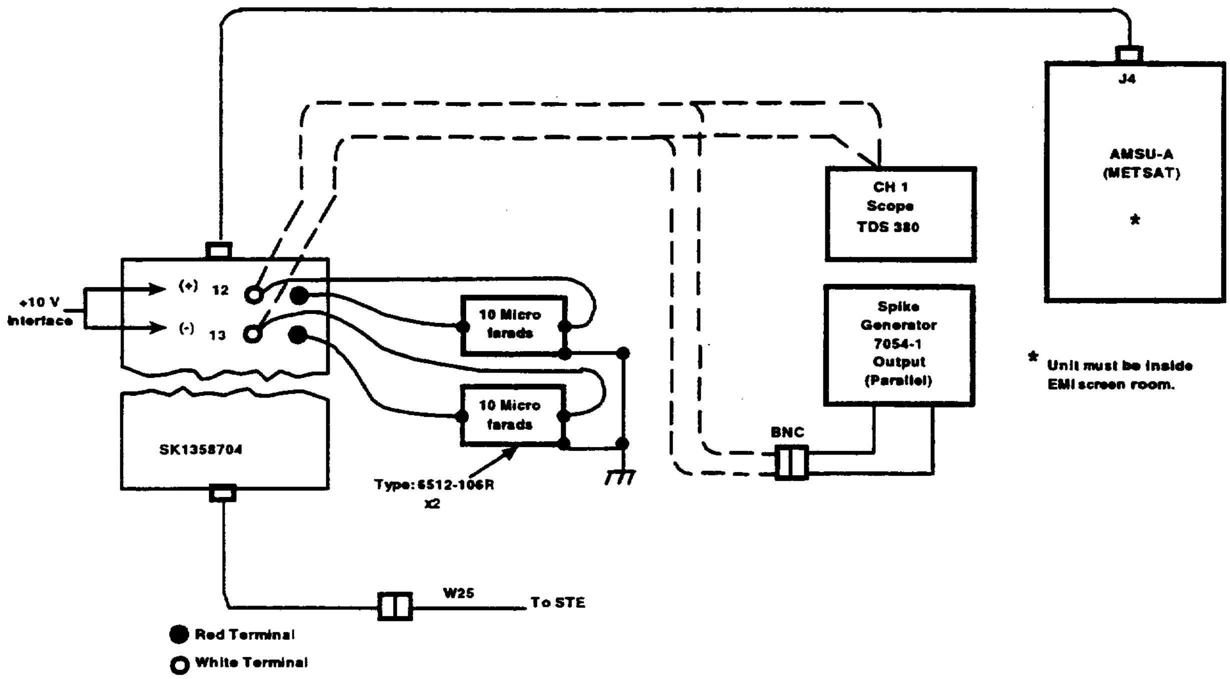


Figure 16b. CS06 +10 V Interface Test Setup (Differential Mode)

3.4.10 ***Radiated susceptibility test, RS03.*** This test shall be used to determine if the AMSU system is susceptible to electric fields. The instrument shall be operated in the IN ORBIT mode.

3.4.10.1 ***Test equipment.*** The following equipment or equivalent is required for this test:

a. Spectrum Analyzer, HP 8566B

b. Frequency Synthesizer, HP 3325

c. Amplifier, AIL-Tech Models 5001, 5020B, 3552B, and 15100B; AR 100W1000M7 (Rental)

d. Travelling Wave Tube Amplifier (TWTA), Varian Models VZL-6941K1, VZS 6951K2, VZC 6961K2, VZM 6991K3; VZL-6942G1, VZC6962G1 (Rentals)

e. Field Strength Sensor, IFI EFS-1

f. Antenna, AIL-Tech Models 96003, 93490-1, and 93491-2

g. Antenna, Ridged Guide, Electro-Metrics Model RGA-180

h. Signal Generator, HP 83623A

i. Digital Voltmeter, HP 3455A

j. Electric Field Monitor, Amp Research, FM 2000, 10kHz to 1 GHz, with electric field probe PM 2000 (rental)

3.4.10.2 ***Test limits.*** The test will be performed at the radiated levels and frequencies indicated in Table VI. If susceptibility is observed at any frequency, the field strength will be lowered to determine the threshold level.

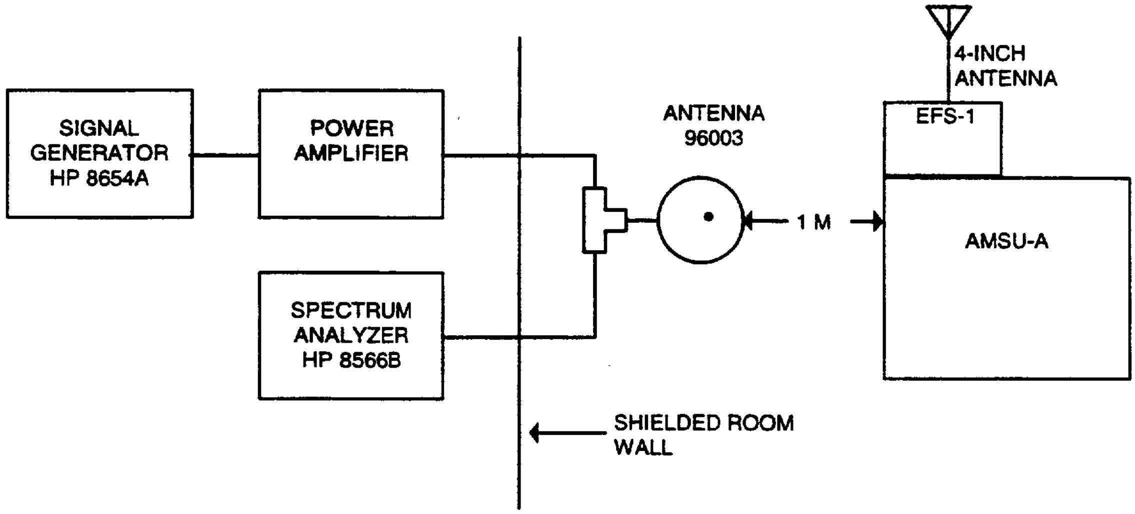
Table VI. Additional Test Frequencies

Frequency (MHz)	METSAT		METOP**	
	AMSU-A1 (V/M)	AMSU-A2 (V/M)	AMSU-A1 (V/M)	AMSU-A2 (V/M)
137.35/137.77		5.0		
137.1 *	-	-	37	32
137.5/137.62	6.9	9.0	-	-
468 *	-	-	12	18
1544.5 *	10.5	22.5	14	31
1698.0	9.8	22.5	-	-
1701.3 *	-	-	38	52
1702.5	4.8	8.2	-	-
1707.0	18.4	13.1	-	-
2230.0 *	-	-	10	10
2247.5	4.3	10.3	-	-
5250.0 *	-	-	38	45
7800.0 *	-	-	8	13
14 kHz/500 MHz *	1	1	1	1
500 MHz/1 GHz *	-	-	1	1
1/18 GHz *	-	-	2	2

* Requires modulation of the applied electric field as indicated below:

14 kHz to 18 GHz	Amplitude modulated by a sine wave at 1 kHz with a modulation depth of 50%.
137.1 MHz	Pulsed at 38.25 kHz PRF, 50% duty cycle.
468 MHz	Pulsed at 1 kHz PRF, 50% duty cycle.
1,544.5 MHz	FM, 400 kHz peak, deviation modulation index M = 1.
1,701.3 MHz	Pulsed 2.25 MHz PRF, 50% duty cycle.
2,2230 MHz	Pulsed 4 kHz PRF, 50% duty cycle.
5,250.0 MHz	Pulsed width = 8.22 ms, chirp rate = -50 kHz/ms, PRF = 4.94 and pulsed width = 10.32, chirp rate = ±24 kHz/ms, PRF = 4.94.
7,800.0 MHz	Pulsed 35 MHz PRF, 50% duty cycle.

** For information only. There are no pass/fail requirements.



14 kHz to 10 GHz Radiating Antennas

Manufacturer	Model	Frequency Range
AIL Tech	96003	14 kHz - 30 MHz
AIL Tech	96002	30 MHz - 200 MHz
AIL Tech	93490-1	200 MHz - 1 GHz
Electrometrics	RGA-180	1 GHz - 18 GHz

14 kHz to 10 GHz Power Amplifiers

Manufacturer	Model	Frequency Range
AIL Tech	5001	14 kHz - 10 MHz
AIL Tech	5020B	1 MHz - 200 MHz
AIL Tech	3552B	100 MHz - 520 MHz
AIL Tech	15100B	500 MHz - 1 GHz
Varian	VZL-6941K1	1 GHz - 2 GHz
Varian	VZS-6951K2	2 GHz - 4 GHz
Varian	VZC-6961K2	4 GHz - 8 GHz
Varian	VZM-6991K3	8 GHz - 18 GHz

Figure 17. RS03 Test Setup, 14 kHz to 25 MHz

3.4.10.3 *Test procedure*

3.4.10.3.1 ***General.*** The output of the oscillator drives a power amplifier and antenna. For frequencies below 200 MHz a field-strength sensor determines the field strength and maintains manual leveling of the power amplifier output. Above 200 MHz the output of the power amplifier shall be set, when possible, to develop 2 volts per meter up to 500 MHz. If susceptibility occurs, the level will be lowered to determine the threshold.

3.4.10.3.2 ***Preparations***

1. Connect the test equipment as shown in Figure 17 using the broadband antenna, AIL-Tech 96003. Fill in Equipment Log on TDS 6.

2. Repeat Steps 2, 3, 4, and 5 of 3.4.5.3.1.

3. Perform the functional test for susceptibility in accordance with the Relative Radiometer NEΔT Measurements procedures specified in AE-26156/3 or AE-26156/4.

3.4.10.3.3 ***Test steps***

1. Power on all test equipment for a 15-minute warmup.

2. Set the generator level control to REAR ONLY.

3. Adjust the signal generator for a 160mV output signal.

4. Adjust the electric field monitor to read the generated electric field on all three orthogonal axes. Since the sensitivity presented in the monitor's digital display is 1.3 V/m minimum, adjust the electric field to read 2 V/m.

5. Adjust the level to that indicated in Table VI throughout the frequency range of 14 kHz to 1 MHz, in the following steps:

   14 - 50 kHz   100 - 500 kHz

   50 - 100 kHz   300 - 1000 kHz.

6. As the frequency range is being scanned at a 90 sec rate, check the leveling by varying the signal drive to the power amplifier.

7. At 1 MHz, switch the antenna FUNCTION switch to the 1 to 30 MHz range.

8. Adjust the level control to the power amplifier to the required level in the frequency range of 1 MHz to 30 MHz in the following steps:

   1 - 5 MHz   5 - 10 MHz   10 - 30 MHz.

9. Monitor the Function Test for each channel by performing data collection test in accordance with Appendix C. Record observation on TDS 7 and attach a printout of the monitored channels' performance data (obtain a baseline before starting the frequency scans, and ensure that the level is as low as possible).

10. Replace the broadband antenna with the biconical antenna.

11. With the frequency set at 30 MHz, adjust the output of the power amplifier for 2 volts per meter.

12. Operate the test equipment controls during the scan. Monitor the test sample for errors while scanning the frequency range between 25 and 200 MHz and recording the data as required in Step 9, using the following frequency ranges:

    30 - 50 MHz   50 - 100 MHz   100 - 200 MHz.

13. Connect the test equipment as shown in Figure 18. Calibration of a radiated level with a second antenna is very time consuming and is only used for special critical frequencies. In cases where the power amplifier gain is relatively flat, the electric field will be calibrated for the required voltage at the lowest level of the

frequency spectrum. To monitor or calibrate radiated level, or both, use the electric field monitor and antennas indicated in 3.4.6.

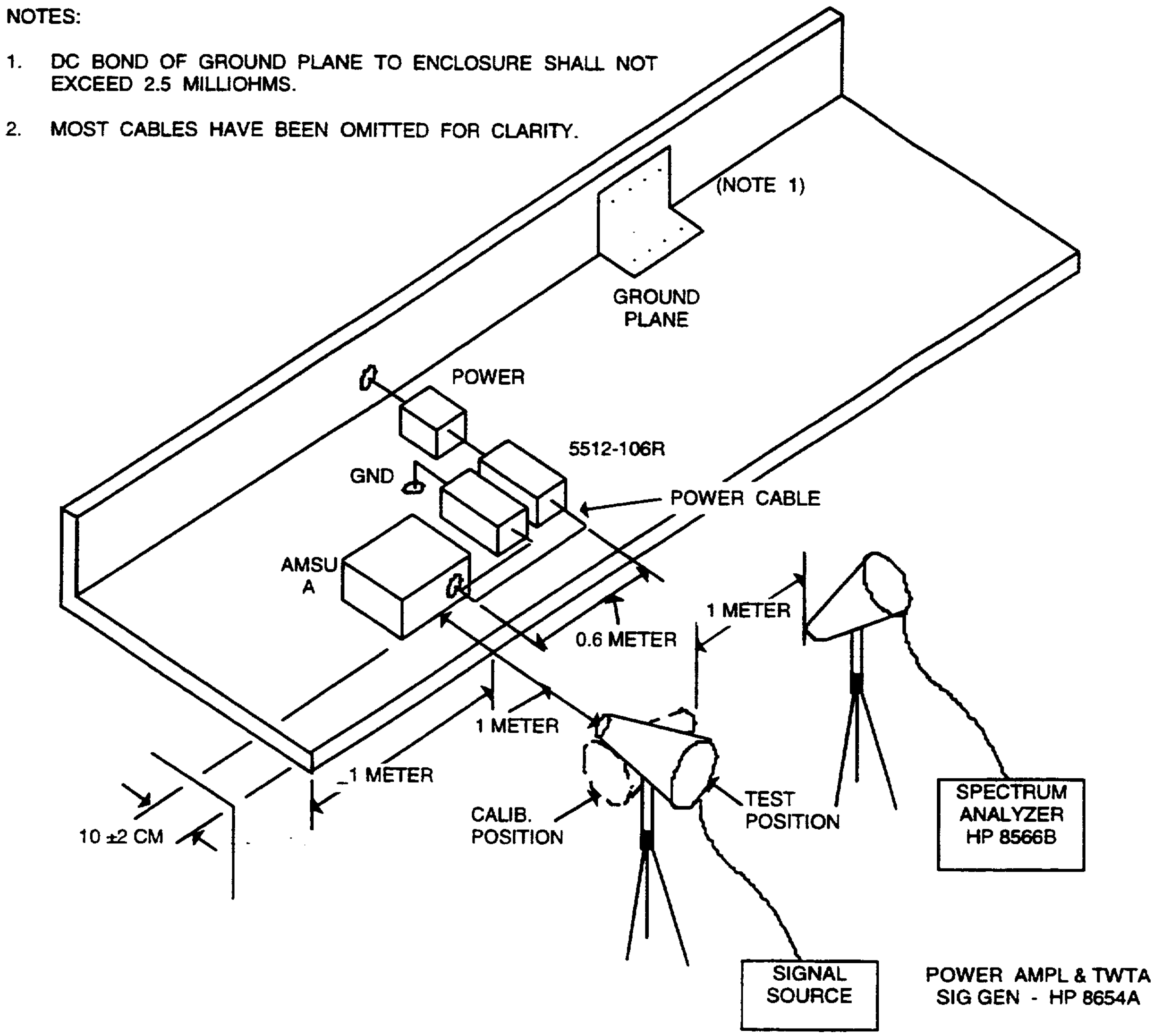


Figure 18. RS03 Test Setup, 200 MHz to 12 GHz

14. Adjust the gain of the amplifier for 2 volts per meter field strength at 200 MHz. Monitor the level with the electric field monitor or by monitoring the power input to the antenna via a directional coupler. Set the level using the following equation:

$$P_T(dBm) = [30\,dB + 10\,Log_{10}(4\pi) + 20\,Log_{10}R + 20\,Log_{10}(E) - 10\,Log_{10}(377) -$$

$$10\,Log_{10}(G_T)\,] - [Directional\ Coupler\,/\,Cable\ Losses]$$

Where: P_T = Transmitter power (dBm)

R = Distance from transmitting antenna (meters)

E = Required electric field intensity (volts/meter)

G_T = Gain of the transmitting antenna.

(Precalculated charts for the desired field strength are available from the Test Engineer.)

15. Make a scan at this level while monitoring the spectrum analyzer to maintain the required power level in dBm.

16. If susceptibility occurs, reduce the output power of the amplifier and determine the susceptibility threshold. Record all pertinent information on TDS 7.

17. Connect the log conical (or horn) antenna as shown on in Figure 18 and connect to the appropriate amplifier.

18. Adjust the gain of the amplifier to the power level indicated in the precalculated chart to produce 2 volts per meter from 200 to 500 MHz (18 GHz for the METOP instrument) or use the calibration procedure of Step 13.

19. If susceptibility occurs, reduce the output power of the power amplifier and determine the susceptibility threshold. Record all pertinent information on TDS 7.

20. Using the appropriate antenna, repeat susceptibility testing at the specific levels and frequencies indicated in Table VI, through the frequency range of 500 MHz to 1 GHz.

21. Obtain a plot of the spectrum analyzer "Peak Search" presentation indicating frequency and attained level.

22. Record the completion of the frequency band and appropriate information in the event of a susceptibility indication.

23. Continue the test with the same set up throughout the frequency range of 500 MHz to 1 GHz at 2 volts/meter level. Use the following frequency bands:

200 – 500 MHz   500 – 1000 MHz

24. Using the horn antenna and the TWT amplifiers, cover the frequency range of 1 to 18 GHz. Use frequency range steps that provide a reasonably flat response of the amplifier.

25. Using the appropriate antenna and amplifier, perform the special frequency test indicated in Table VI.

26. Calibrate the applied field with the two antenna methods.

27. Supply the indicated frequency at the required level for 90 seconds. At the mid interval of the applied time, rotate the antenna to the other polarization.

28. Record the completion of the frequency test and all appropriate information in the event of a susceptibility indication.

29. Repeat steps 25 through 28 for the other discrete frequencies.

4. QUALITY ASSURANCE PROVISIONS

4.1 ***Responsibility for inspection***. Aerojet Quality Assurance shall inspect in accordance with the requirements of this test procedure, S-480-79, and S-480-80. Quality Control shall verify all test set-ups prior to start of test. Bonded software shall be used for all tests and shall be obtained from Quality Control. Quality Control shall review all test data for conformance to success criteria. The test data shall include test limits. For tests that satisfy requirements from S-480-80 on protoflight and flight units, customer representatives shall be invited to monitor tests and shall be invited to review the data and show approval on the test data sheets.

4.1.1 ***Test facilities.*** Unless otherwise specified, the examinations and tests described herein shall be conducted at Aerojet Electronic Systems Division, Azusa facility.

4.2 ***Monitoring procedures.*** All tests shall be monitored by Quality Assurance.

4.2.1 ***Test equipment.*** Test equipment calibration procedures shall comply with the requirements of MIL-STD-45662.

4.3 ***Monitoring procedures for materials.*** Not applicable.

4.4 ***Certification.*** Certification for handling ESD-sensitive equipment is required for all personnel working on the assembly and test of the AMSU-A instrument per STD-2454.

4.5 ***Test methods***

4.5.1 ***Accept-reject criteria.*** The accept-reject criteria for each examination or test shall be as specified in the data sheets included in each phase of the applicable test procedure. The test results shall be recorded on the data sheets to demonstrate compliance with the applicable specification requirements. Methods of analysis shall be appropriate for the parameters being inspected. It shall be the responsibility of Aerojet to review the test data and determine conformance of the unit under test to the performance requirements contained in S-480-80 and this specification.

In the event of a failure during any phase of this test procedure, the test activity shall record the required information on the Test Anomaly Report (TAR) and alert the design assurance and quality engineers. Except for Conducted and Radiated Emission (CE and RE) tests, which are non-destructive, the testing must be stopped until a complete description of the observed anomaly failure is documented and a Failure Analysis Strategy (FAS) is formulated, documented, and implemented to preclude loss of information or evidence that may facilitate determining the failure cause. The full spectrum of interference is required in order to formulate a plan of action. Conducted and Radiated Susceptibility (CS and RS) tests can be continued only after assuring that the data collection activity will not damage or stress any of the components of the AMSU-A instrument. The cognizant reliability engineer, quality assurance engineer, and the system or responsible test engineer shall jointly develop the FAS. Analysis and reporting shall be performed per Aerojet procedures.

4.5.2 ***General.*** A test report shall be prepared in accordance with paragraph 4.5.2.1.1 at the successful completion of testing. This report shall include all data sheets associated with the tests on the unit plus the data reduction and analysis of specific parameters required by each applicable test procedure specification obtained from screen printouts and plots, and oscilloscope photographs or magnetic recordings. During tests in which a CRT screen is to be printed or plotted and retained as a data sheet, the following annotation shall be applied:

Engineer: ______________________________
(Signature) (Date)

Quality Control: ______________________________
(Signature) (Date)

Customer representative: ______________________________
(Signature) (Date)

Test Paragraph No.: ______________________________

Subassembly/Assembly Serial No.: ______________________________

The report shall also include a certification statement.

4.5.2.1 ***Acceptance test reports***

4.5.2.1.1 ***Format.*** The acceptance test report shall be prepared and shall include, as a minimum, the following:

a. Title page

b. Table of contents

c. Summary

d. Reason for test

e. Abstract, conclusions, and recommendations

f. References

g. Results of tests

h. Test data.

4.5.2.1.2 ***Test data.*** The test data included in the report shall be that which was obtained in the tests specified herein and recorded on the Test Data Sheets (TDS), printouts, and plots.

5. PREPARATION FOR DELIVERY

Not applicable.

6. NOTES

6.1 ***Intended use.*** The intended use of this process specification is to establish the general methods and acceptance test procedures for Electromagnetic Interference (EMI), Electromagnetic Radiation (EMR), and the Electromagnetic Compatibility (EMC) procedures for the Advanced Microwave Sounding Unit - A (AMSU-A).

6.2 ***Abbreviations and acronyms***

AF	Audio frequency
AM	Amplitude modulated
AMSU	Advanced Microwave Sounding Unit
BB	Broadband
CCA	Card cage assembly
CCS	Computer Controlled System
CE	Conducted emissions
C.P.	Current probe
CRT	Computer screen display
CS	Conducted susceptibility
DMM	Digital multimeter
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
EMISM	Electromagnetic interference safety margin
EMR	Electromagnetic radiation
ESD	Electrostatic discharge
FAS	Failure Analysis Strategy
FM	Frequency modulated
Gen.	Generator
GFE	Government furnished equipment
GIIS	General Instrument Interface Specification
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
HF	High frequency
HP	Hewlett-Packard
IFI	Instruments for Industry
ITT	International Telephone and Telegraph
LPT	Limited Performance Test
RE	Radiated emissions
RF	Radio frequency
RIFI	Radio interference, field intensity

RMS	Root mean squared
RS	Radiated susceptibility
SHF	Super high frequency
SP6T	Single pole six throw
SS	Solid state
STE	Special Test Equipment
TAR	Test Anomaly Report
TDS	Test Data Sheet
TWTA	Traveling wave tube amplifier
UHF	Ultra high frequency
UIIS	Unique Instrument Interface Specification
VHF	Very high frequency

6.3 ***Changes***. The outside margins of this document have been marked to indicate where modifications, deletions, or additions have been made since the previous issue. This is done solely as a convenience to users, who are cautioned to evaluate the requirements of this change and the parent standard based on the entire content as written, regardless of the marginal notations and relationship to the previous issue.

10. APPENDIX A TEST INSTRUMENTATION

10.1 ***Test instrumentation list for EMI/EMC tests.*** See Table A-I.

10.2 ***Relative gain of the 94455-1 biconical antenna.*** The calculations for the gain of the biconical antenna and the tuned dipole antenna referenced to an isotropic radiator are listed in Table A-II. The delta difference of the antennas will provide relative gain of one with respect to the other. The basic equation for the calculations is:

$$\Delta F = 20Log_{10} f - 10Log_{10} G - 29.78\ dB/m$$

Where: ΔF = Antenna Factor in dB

f = Frequency in MHz

G = Gain (power ratio).

Table A-I. Test Instrumentation List for EMI/EMC Tests (Sheet 1 of 2)

Description	Manufacturer*		Test Usage			
	Name	Model No.	CE	RE	CS	RS
EMI RECEIVERS AND METERS						
Calculator-Controlled EMI System, 20 Hz-1 GHz, containing:	Electro-Metrics	CCS-125	X	X		
(a) EMC-10 (20 Hz-50 KHz)						
(b) EMC-25 (10 KHz-1 GHz)						
(c) HP-9836S Calculator						
(d) DIU-125, DSA-125, SU-125						
Spectrum Analyzer	Hewlett-Packard	8566B	X			
(a)Computer		9836				
(b)Plotter		7090A				
(c)Printer		2678A				
Oscilloscope	Tektronix	7626			X	
Gauss Meter	FW Bell	9901		X		
Digital Voltmeter	Hewlett-Packard	3455A			X	
SIGNAL GENERATORS/SOURCES						
Function Generator,	Hewlett-Packard	3325			X	
Sweep Generator	Wiltron	6659B			X	X
RF Transient Generator	Solar Elect.	7054-1			X	
AMPLIFIERS						
Audio Amplifier, 200W. 20 Hz-50 KHz	McIntosh	MC-2205			X	
Broadband Linear, 50W, 10- KHz-10 MHz	AIL Tech.	5001				X
Broadband Linear, 50W, 1-200 MHz	AIL Tech.	5020B				X
Broadband Linear, 50W, 100-520 MHz	AIL Tech.	3552B				X
Broadband Linear, 20W, 500-1000 MHz	AIL Tech.	15100B				X
TWTA, 20W, 1-2 GHz	Varian	VZL-6541K1				X
TWTA, 20W, 2-4 GHz	Varian	VZS-6951K2				X
TWTA, 20W, 4-8 GHz	Varian	VZC-6961K2				X
TWTA, 20W, 8-18 GHz	Varian	VZM-6991K3				X
Amplifier (Amp), 2-4 GHz	MITEQ	AFD3-025-035-13		X		
Amp, 60dB, 100-450 MHz, NF - 1.5 dB	RHG Elect Lab	1CLW300CM		X		
Amplifier	Hewlett-Packard	HP8447F	X	X		
Amplifier	Hewlett-Packard	HP-461A	X	X		
CURRENT FIELD PROBES						
RF Current Probe, 30 Hz-100 MHz	AIL Tech	91550-1	X			
Magnetometer Probe	Hewlett-Packard	3529A		X		
Magna Probe	FW Bell	BEL-MOX-99-2506		X		
Field Strength Sensor	IFI	EFS-1				X
ANTENNAS						
Double-Ridged Guide Antenna, 1-18 GHz	EMCO	3115		X		X
Log Spiral Antenna, 0.2-1 GHz	AIL Tech.	93490-1		X		X
Biconical Antenna, 20-200 MHz	AIL Tech.	96002		X		
Parallel Element, 200V/m, 10 KHz-30 MHz	AIL Tech.	96003				X
Log Spiral, 200 MHz to 1 GHz	EMCO	3101		X		
Biconical, 20-200 MHz	EMCO	3104		X		
Active Rod w/Counterpoise, 14 kHz to 30 MHz	EMCO	3301B		X		

* Or Equivalent

Table A-I. Test Instrumentation List for EMI/EMC Tests (Sheet 2 of 2)

Description	Manufacturer*		Test Usage			
	Name	Model No.	CE	RE	CS	RS
COUPLERS						
Isolation Transformer, 30 Hz-250 kHz	Solar Elect.	6220-1A			X	
PERIPHERALS						
Oscilloscope Camera	Tektronix	C12		X		
Intelligent Serial Thermal Printer	Hewlett-Packard	2673A	X			
ACCESSORIES						
10 µF Feedthrough Capacitor, 1 KHz-1 GHz	Solar Elect.	6512-106R	X	X	X	
MISCELLANEOUS						
Breakout box	Aerojet	–	X	X	X	X
EMI Filter Box	Aerojet	T-1289992-1	X	X	X	X

* Or Equivalent.

Table A-II. Relative Gain of the 94455-1 Biconical Antenna and a Tuned Dipole

Frequency (MHz)	Gain (Numeric)		
	Biconical	Tuned Dipole	Relative Biconical
25	0.036	1.472	-1.436
30	0.054	1.191	-1.137
50	0.173	1.513	-1.34
70	0.777	1.486	-0.709
100	0.617	1.555	-0.938
150	0.549	1.331	-0.782
200	1.171	1.242	-0.071

Table A-III. EMI/EMC Test Performance Matrix
(Qualification Test)

Test Method & Description	Requirement METSAT	Requirement METOP	+28V Main Bus	28V Main Bus Rtn	+28V Pulsed Bus Load	28V Pulsed Bus Load Rtn	+28V Analog Telemetry Bus	28V Analog Telemetry Bus Rtn	+10V Interface Bus	10V Interface Bus Rtn	+28V Safety Heater	28V Safety Heater Rtn	AMSU-A Instrument
CE01 (30 Hz to 20 kHz) DM		X	X	X	X	X	X	X	X	X	X	X	
CM		X	T		T		T		T				
CE03 20 kHz to 50 MHz) DM	X	X	X	X	X	X	X	X	X	X	X	X	
CM		X	T		T		T		T				
CS01/CS02 (30 Hz to 150 kHz) DM	X		X	X	X	X	X	X	X	X			
CS02 (100 kHz to 50 MHz) CM		X		X		X		X		X			
CS06 (Spike) DM	X	X	X	X	X	X	X	X	X	X			
RE02 *	X	X											X
RE04	X												X
RS03	X	X											X

X Test performed on powerline.

T Test performed together with high side and return.

* For Acceptance only, perform electric field radiation frequency range 2010 - 2040 MHz (paragraph 3.4.6) and frequency range of Table IV.

20. APPENDIX B TEST DATA SHEETS

This appendix contains the test data sheets (TDS) for the inspections and test procedures in Section 3.

TEST DATA SHEET 1 (Sheet 1 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 30 Hz to 20 kHz, (DM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figures 2 & 3			
4	28V Main Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3			
7	28V Telemetry Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V PLB	Narrow	See Figures 2 & 3			
7	28V PLB Rtn	Narrow	See Figures 2 & 3			
7	+10V Interface Bus	Narrow	See Figures 2 & 3			
7	10V Interface Bus Ret	Narrow	See Figures 2 & 3			
7	Safety Heater	Narrow	See Figure 4			
7	Safety Heater Return	Narrow	See Figure 4			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper __________ Customer Representative: ______________________

TEST DATA SHEET 1 (Sheet 2 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.2: Emission Measurements, 30 Hz to 20 kHz, (CM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figure 2			
7	+28V Telemetry Bus	Narrow	See Figure 2			
7	+28V PLB	Narrow	See Figure 2			
7	+10V Interface Bus	Narrow	See Figure 2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 1 (Sheet 3 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (DM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figures 2 & 3			
4	28V Main Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3			
7	28V Telemetry Bus Rtn	Narrow	See Figures 2 & 3			
7	+28V PLB	Narrow	See Figures 2 & 3			
7	28V PLB Rtn	Narrow	See Figures 2 & 3			
7	+10V Interface Bus	Narrow	See Figures 2 & 3			
7	10V Interface Bus Ret	Narrow	See Figures 2 & 3			
7	Safety Heater	Narrow	See Figure 4			
7	Safety Heater Return	Narrow	See Figure 4			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ______________ Oper __________ Customer Representative: ______________________

TEST DATA SHEET 1 (Sheet 4 of 4)
3.4.5: CE01/CE03 Test

Test Setup Verified: ______________________________
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (CM)

Step	Power Line	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	+28V Main Bus	Narrow	See Figure 3			
7	+28V Telemetry Bus	Narrow	See Figure 3			
7	+28V PLB	Narrow	See Figure 3			
7	+10V Interface Bus	Narrow	See Figure 3			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 2 (Sheet 1 of 3)
3.4.6: RE02 Test

Test Setup Verified: ______________________________
Signature

3.4.6.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

TEST DATA SHEET 2 (Sheet 2 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna/Frequency	Band	Required	Emissions within limits?		Comments/ Observations
				Yes	No	
4	All except Horn 14 kHz to 1 GHz	Narrow	See Figure 6			
6	All except Horn 14 kHz to 1 GHz	Broad	See Figure 7			
12	Horn, RGA-180 1 to 2 GHz	Narrow	See Figure 6			
15	Biconical, EMCO 3104 121.5 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm			
16	Log Conical, EMCO 3101 243 MHz, 401.65 MHz, & 406.05 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm			
19	Horn, RGA-180 2010 to 2040 MHz with Ampl	Narrow	No narrow-band freq. > -120 dBm			
21	Biconical/Log Conical 59.458 to 751.944 MHz	Narrow	No narrow-band freq. > -60 dBm			
21	400 to 500 MHz	Narrow	-107.1dBm			
21	2 to 18 GHz	Narrow	Figure 3			
21	1217 to 1227 MHz	Narrow	-111.8 dBm			
21	1565 to 1614 MHz	Narrow	-111.2 dBm			
21	2051.9 to 2055 MHz	Narrow	-126.7 dBm			
21	5254.7 to 5255.3 MHz	Narrow	-122.8 dBm			
21	5450 to 5825 MHz	Narrow	-80.7 dBm			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

TEST DATA SHEET 2 (Sheet 3 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna*/Frequency Range (MHz)	Band	Radiation Limit (dBm)	Emissions within limits?		Comments/ Observations
				Yes	No	
22	118.000 - 120.000	Narrow	-100 / Table IV			
22	120.000 -121.450	Narrow	-125 / Table IV			
22	121.450 - 121.485	Narrow	-145 / Table IV			
22	121.515 - 121.550	Narrow	-145 / Table IV			
22	121.550 - 123.000	Narrow	-125 / Table IV			
22	123.000 - 125.000	Narrow	-100 / Table IV			
23	236.000 - 240.000	Narrow	-100 / Table IV			
23	240.000 - 242.925	Narrow	-125 / Table IV			
23	242.925 - 242.975	Narrow	-145 / Table IV			
23	243.025 - 243.075	Narrow	-145 / Table IV			
23	243.075 - 246.000	Narrow	-125 / Table IV			
23	246.000 - 250.000	Narrow	-100 / Table IV			
23	385.100 - 401.100	Narrow	-100 / Table IV			
23	401.100 - 405.900	Narrow	-125 / Table IV			
23	405.900 - 406.000	Narrow	-145 / Table IV			
23	406.1 00 - 406.200	Narrow	-145 / Table IV			
23	406.200 - 411.00	Narrow	-125 / Table IV			
23	411.000 - 425.000	Narrow	-100 / Table IV			
23	396.000 - 401.500	Narrow	-125 / Table IV			
23	401.500 - 401.600	Narrow	-145 / Table IV			
23	401.700 - 401.800	Narrow	-145 / Table IV			
23	401.800 - 406.000	Narrow	-125 / Table IV			

* All frequency ranges are to be performed with antenna in both vertical and horizontal polarization.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 3 (Sheet 1 of 3)
3.4.7: RE04 Test

Test Setup Verified: ______________________________
Signature

3.4.7.3.1 Step 2: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.7.3.2 Step 3: Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.
* Relative to instrument connector side.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 3 (Sheet 2 of 3)
3.4.7: RE04 Test (Cont)

Test Setup Verified: ____
Signature

3.4.7.3.2 Step 9 (10 inches above): Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.

* Relative to instrument connector side.

TEST DATA SHEET 3 (Sheet 3 of 3)
3.4.7: RE04 Test (Cont)

Test Setup Verified: ______________________________
Signature

3.4.7.3.2 Step 9 (10 inches above): Magnetic Field Emissions

Step	Direction*	Measured	Required	Mag field within limits?		Comments/ Observations
				Yes	No	
	0 degrees		See 3.4.7.2			
	30 degrees		See 3.4.7.2			
	60 degrees		See 3.4.7.2			
	90 degrees		See 3.4.7.2			
	120 degrees		See 3.4.7.2			
	150 degrees		See 3.4.7.2			
	180 degrees		See 3.4.7.2			
	210 degrees		See 3.4.7.2			
	240 degrees		See 3.4.7.2			
	270 degrees		See 3.4.7.2			
	300 degrees		See 3.4.7.2			
	330 degrees		See 3.4.7.2			

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test log, additional comments or observations, etc.) to this data sheet.
* Relative to instrument connector side.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 4 (Sheet 1 of 4)
3.4.8: CS01/CS02 Test

Test Setup Verified: ______________________________
Signature

3.4.8.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.8.3.2: Susceptibility to Injected Electromagnetic Energy on Power Leads, 30 Hz to 150 kHz

+28V Main Power Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________ Oper ________ Customer Representative: ______________________

TEST DATA SHEET 4 (Sheet 2 of 4)
3.4.8: CS01/CS02 Test (Cont)

28V Main Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+28V Pulse Load Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

28V Pulse Load Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 4 (Sheet 3 of 4)
3.4.8: CS01/CS02 Test (Cont)

+28V Analog Telemetry Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

28V Analog Telemetry Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+10V Interface Bus

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 4 (Sheet 4 of 4)
3.4.8: CS01/CS02 Test (Cont)

10V Interface Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

*** ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit**

TEST DATA SHEET 5 (Sheet 1 of 2)
3.4.8: CS02 Test (CM)

Test Setup Verified: ______________________________
Signature

3.4.8.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.8.3.2: Susceptibility to Injected Electromagnetic Energy on Power Leads, 100 kHz to 50 MHz, CM

+28V Main Power Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ______________Oper __________ Customer Representative: ______________________

TEST DATA SHEET 5 (Sheet 2 of 2)
3.4.8: CS02 Test, (CM) (Cont)

+28V Pulse Load Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+28V Analog Telemetry Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

+10V Interface Bus Return

Frequency Range	Test Level (Volts)	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria (Volts)	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 6 (Sheet 1 of 2)
3.4.9: CS06 Test

Test Setup Verified: ______________________________
Signature

3.4.9.3.1 Step 3: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

3.4.9.3.2: Susceptibility to Injected Transients on Power Leads

+28V Main Power Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

+28V Analog Telemetry Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ____________Oper __________ Customer Representative: ______________________

TEST DATA SHEET 6 (Sheet 2 of 2)
3.4.9: CS06 Test (Cont)

+28V Pulse Load Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
8V, Positive	See Figure 9						
13V, Negative	See Figure 9						

+10V Interface Bus

Pulse Amplitude and Polarity	Signal Type or Waveform	Test Level	Limit Factor*			Spec Limit Criteria	Comments/ Observations
			ST	EL	SL		
10V, Positive	See Figure 9						
12V, Negative	See Figure 9						

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

TEST DATA SHEET 7 (Sheet 1 of 2)
3.4.10: RS03 Test

Test Setup Verified: ______________________________
Signature

3.4.10.3.2 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit ______________________ Engineer: ______________________

Serial No. ______________________ Quality Control: ______________________

Shop Order ______________ Oper __________ Customer Representative: ______________________

TEST DATA SHEET 7 (Sheet 2 of 2)
3.4.10: RS03 Test (Cont)

3.4.10.3.3: Susceptibility to Radiated Electric Fields

Frequency Range	Test Level V/m	Signal Type or Waveform	Limit Factor*			Spec Limit Criteria V/m	Comments/ Observations
			ST	EL	SL		

* ST = Susceptibility Threshold, EL = Equipment Limit, SL = Specification Limit

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30. APPENDIX C EMI DATA COLLECTION

This Appendix contains the EMI data collection process and steps performed during EMI testing.

30.1 ***EMI data collection during the susceptibility tests.*** EMI data collection during the susceptibility tests will be accomplished by the following data collection steps.

30.2 ***Data collection.*** Actual data collection will be accomplished as described in the following steps.

1. Start data collection. From the Main menu, select command "[7 } SPECIAL CYCLE CALIBRATION". The CRT screen will go into the TEST INITIALIZATION menu. Select command "[13] SCANS TO ACQUIRE". Enter 24 as the number of scans (for 90 second sweep time).

2. Select command "[16] START DATA ACQUISITION". Coordinate with the EMI equipment operator and start the sweep of the EMI frequency band being tested when the scan count reaches about (6).

3. Stop data collection. Coordinate with the EMI equipment operator such that the data collection process is stopped about (19) scans after the EMI frequency band sweep is complete. At the end of the 24 scans, the screen will change to the AMSU-A1/A2 DELTA T and CALIBRATION ACCURACY menu.

4. Display and print the data collected. Press "[2] PRINT" to print the screen. Press "[1] RETURN". The display will prompt "Do you wish to save data on disk (Y/N)?" Enter N for no.

5. The STE program will return to the AMSU-A1/A2 TEST INITIALIZATION menu. Enter command "[15] SELECT CAL PROCESS" and press the ENTER key. The program will return to the AMSU-A1/A2 CALIBRATION PROCESS SELECTION menu.

6. Print the distribution. Select "[12] PRINT DISTRIBUTION" to obtain the data plot for each sensor channel. Select "[1] RETURN" to return to the AMSU-A1/A2 TEST INITIALIZATION menu.

7. Examine each channel's response (Warm AVE) and evaluate it with the susceptibility criteria to determine if pass or fail test results were obtained. If the data passes, proceed to the next EMI test and if the data fails, repeat the test at reduced frequency range and amplitude level (using the same procedures), to establish the frequency and threshold level of AMSU performance.

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GENCORP AEROJET

DOCUMENT APPROVAL SHEET

TITLE	DOCUMENT NO.
Process Specification Test Procedure, Electromagnetic Interference (EMI)/Electromagnetic Radiation (EMR) and Electromagnetic Compatibility (EMC) for the METSAT/METOP Advanced Microwave Sounding Unit – A (AMUS-A)	AE-26151/5E 11 February 1999

INPUT FROM:	DATE	CDRL:	SPECIFICATION ENGINEER:	DATE
L. Paliwoda		301A	G. Waki	

CHECKED BY:	DATE	JOB NUMBER:	DATE
J. Grime		N/A	

APPROVED SIGNATURES	DEPT. NO.	DATE
Product Team Leader (L. Paliwoda) Larry T. Paliwoda	7888	2/26/99
Technical Director/PMO (P. Patel) P. K. Patel	8311	2/26/99
Released: Configuration Management (J. Cavanaugh) J. Cavanaugh	8361	3/1/99

Approved as Final per customer's letter dated 24February 1999 (ECN CAMSU-2045)

By my signature, I certify the above document has been reviewed by me and concurs with the technical requirements related to my area of responsibility.

(Data Center) FINAL

C. MackeSunda 3-1-99

TEST DATA SHEET 1 (Sheet 1 of ~~1~~ 2)
3.4.5: CE01/CE03 Test ~~Ref~~ Current Ripple Test
2 Dec 99

Test Setup Verified: K. Voigt 12/1/99
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date
Spectrum Analyzer	HP	3562A	51225	4-12-99	4-12-00
Current Probe	AilTech	91550-2B	L509571	11-11-99	11-11-01
Plotter	HP	7470A	49222	CNR	CNR

3.4.5.3.2: Emission Measurements, 30 Hz to 20 kHz, (DM)

Step	Power Line	Band	Required	Emissions within limits? Yes	No	Comments/ Observations Mode / Plot
4	+28V Main Bus	Narrow	See Figures 2 & 3	✓		Full Scan 1
~~4~~	~~28V Main Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~			
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3	✓ ✓		Full Scan 11; Inst Off 7 & 9
~~7~~	~~28V Telemetry Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~			
7	+28V PLB	Narrow	See Figures 2 & 3	✓		Warm Cal 3
~~7~~	~~28V PLB Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~			
7	+10V Interface Bus	Narrow	See Figures 2 & 3	✓		Full Scan 5
~~7~~	~~10V Interface Bus Ret~~	~~Narrow~~	~~See Figures 2 & 3~~			
~~7~~	~~Safety Heater~~	~~Narrow~~	~~See Figure 4~~			
~~7~~	~~Safety Heater Return~~	~~Narrow~~	~~See Figure 4~~			

2 Dec 99

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit AMSU-A2 1331200-2 — Engineer: 2 Dec 99

Serial No. 108 — Quality Control: Judi Honey QA 269 DEC 02 1999

Shop Order 786083 Oper 50-0-00 — Customer Representative: 12-3-99

TEST DATA SHEET 1 (Sheet ~~3~~ 2 of ~~4~~ 2)
3.4.5: CE01/CE03 Test ~~Ret~~
Current Ripple Test

2 Dec 99

Test Setup Verified: K. Hind 12/2/99
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date
Spectrum Analyzer	HP	8566B	54861	11-20-99	6-20-00
Amplifier	HP	8447F Opt H64	C200230	9-15-99	1-15-01
Current Probe	Ail Tech	91550-2B	L509571	11-11-99	11-11-01
Computer	HP	9836	46134-15	CNR	CNR
Plotter	HP	7475A	47417	CNR	CNR
Printer	HP	2671G	07202	CNR	CNR

3.4.5.3.2: Emission Measurements, 20 kHz to 50 MHz, (DM)

Step	Power Line	Band	Required	Emissions within limits? Yes	No	Mode	Comments/ Observations	Plot
4	+28V Main Bus	Narrow	See Figures 2 & 3	✓		Full Scan		2
~~4~~	~~28V Main Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~					
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3	✓ ✓		Full Scan Inst Off		12 8 & 10
~~7~~	~~28V Telemetry Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~					
7	+28V PLB	Narrow	See Figures 2 & 3	✓		Warm Cal		4
~~7~~	~~28V PLB Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~					
7	+10V Interface Bus	Narrow	See Figures 2 & 3	✓		Full Scan		6
~~7~~	~~10V Interface Bus Ret~~	~~Narrow~~	~~See Figures 2 & 3~~					
~~7~~	~~Safety Heater~~	~~Narrow~~	~~See Figure 4~~					
~~7~~	~~Safety Heater Return~~	~~Narrow~~	~~See Figure 4~~					

2 Dec 99

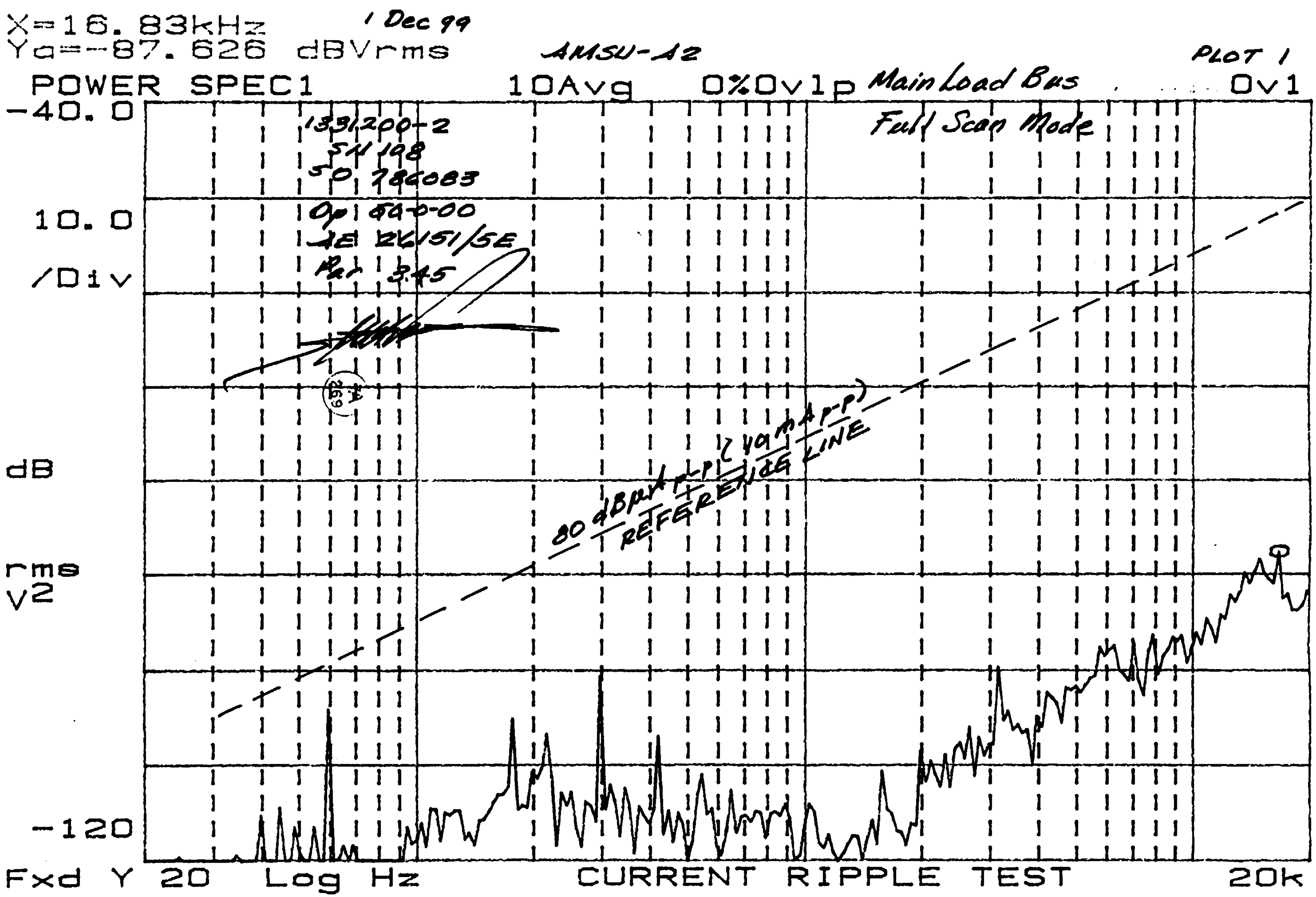
NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

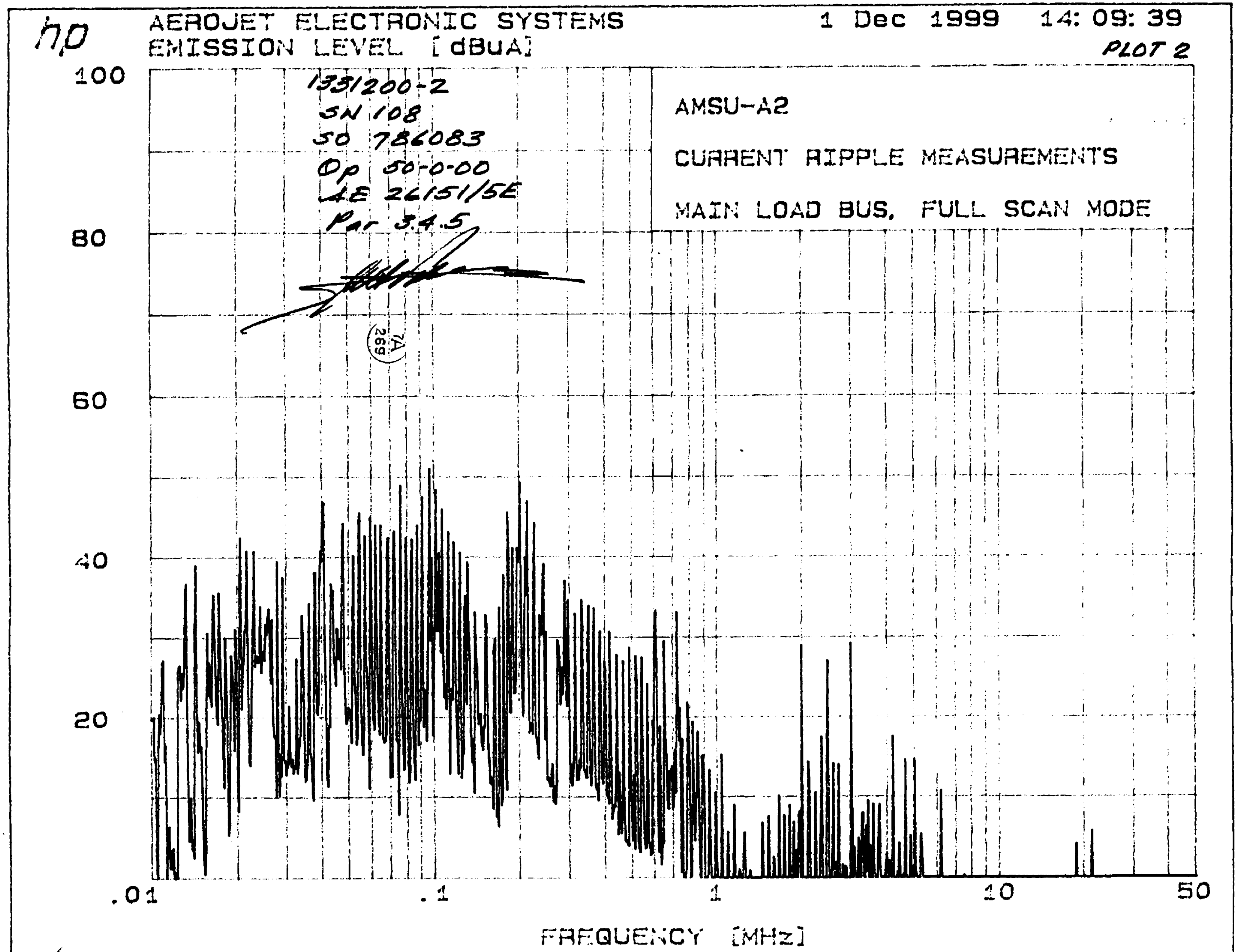
Signature/Date

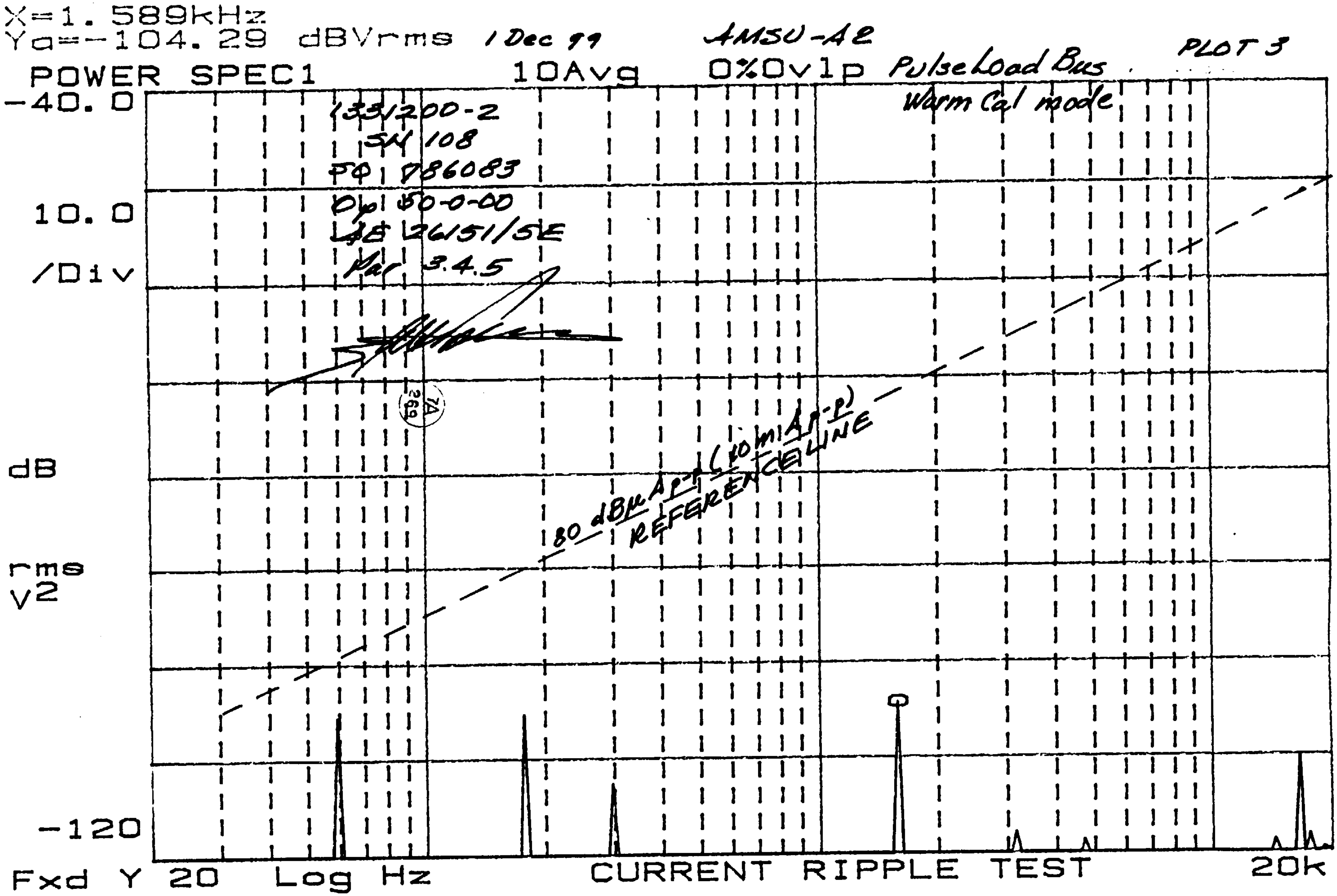
Unit AMSU-A2 1331200-2 — Engineer: [signature] 2 Dec 99

Serial No. 108 — Quality Control: DEC 02 1999 Judea Dorwee (7A 269)

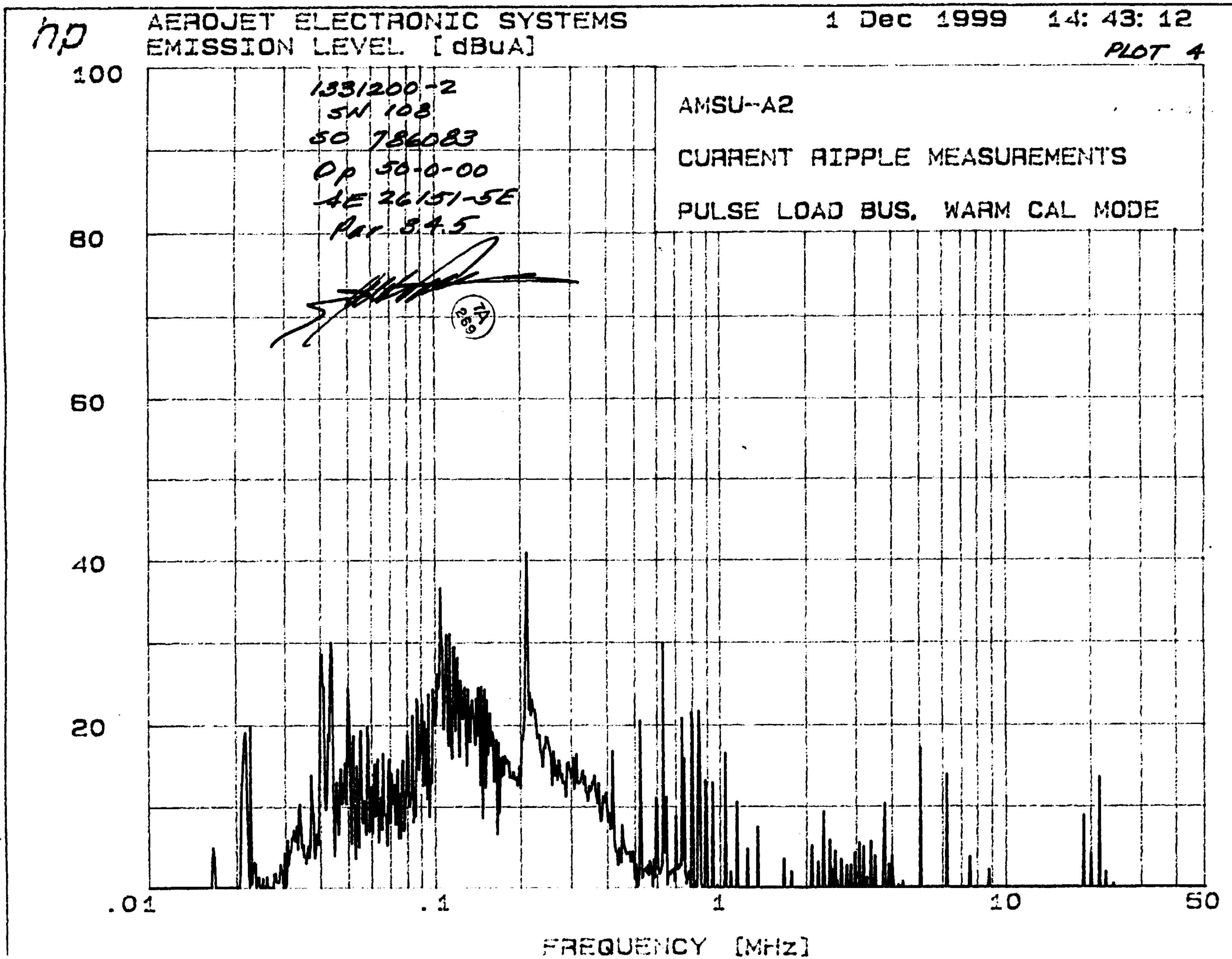
Shop Order 786083 Oper 50-0-00 — Customer Representative: [stamp] 12-3-99


X=16.83kHz
Ya=-87.626 dBVrms
1 Dec 99
AMSU-A2
PLOT 1
POWER SPEC1
10Avg
0%0v1p
Main Load Bus
0v1
Full Scan Mode
-40.0
10.0
/Div
dB
rms
V2
-120
1331200-2
SN 108
SO 786083
Op 60-0-00
4E 26/51/5E
Par 3.45
80 dBµA p-p (49mA p-p)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k

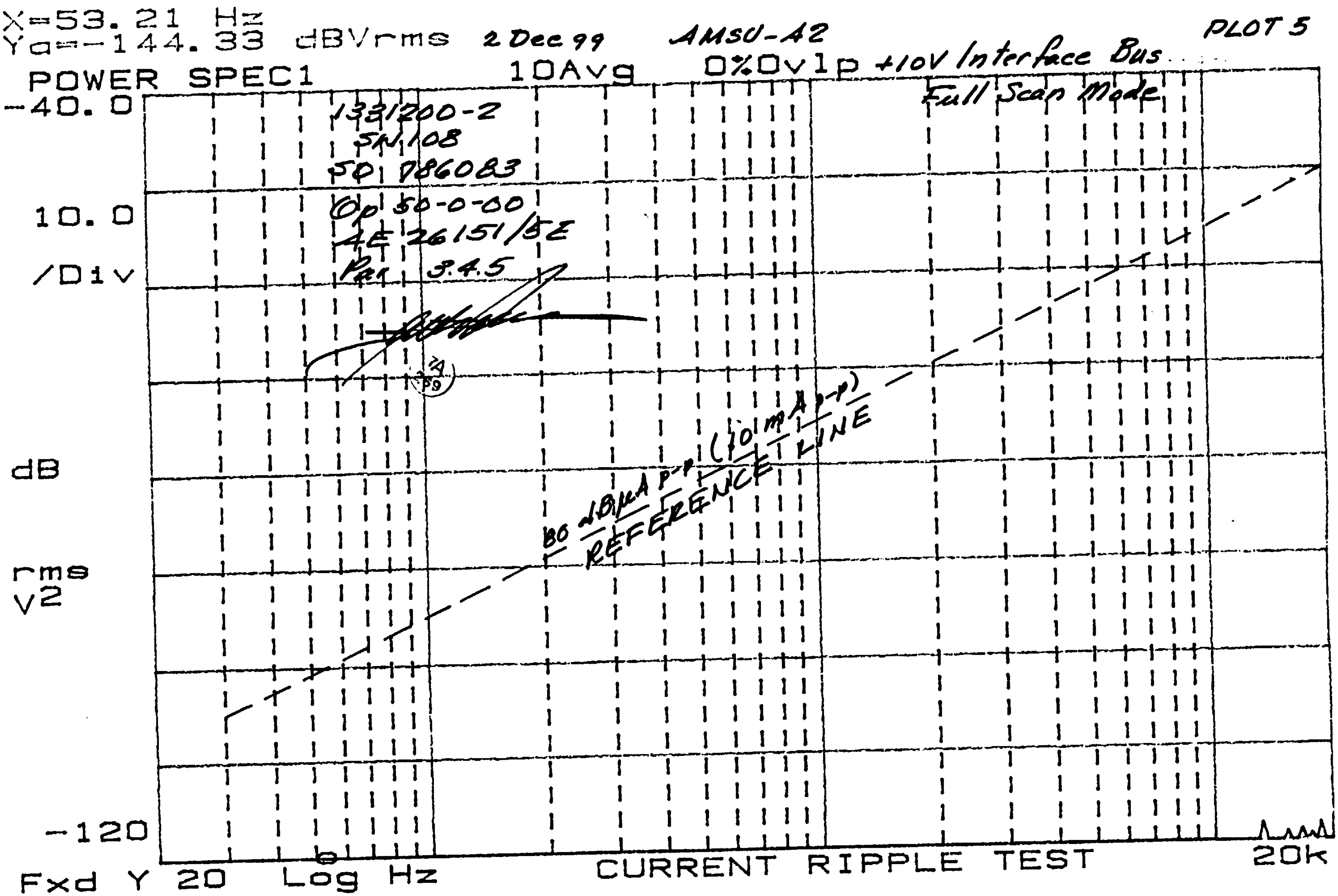

hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
1 Dec 1999 14:09:39
PLOT 2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5
7A
269
AMSU-A2
CURRENT RIPPLE MEASUREMENTS
MAIN LOAD BUS, FULL SCAN MODE
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]



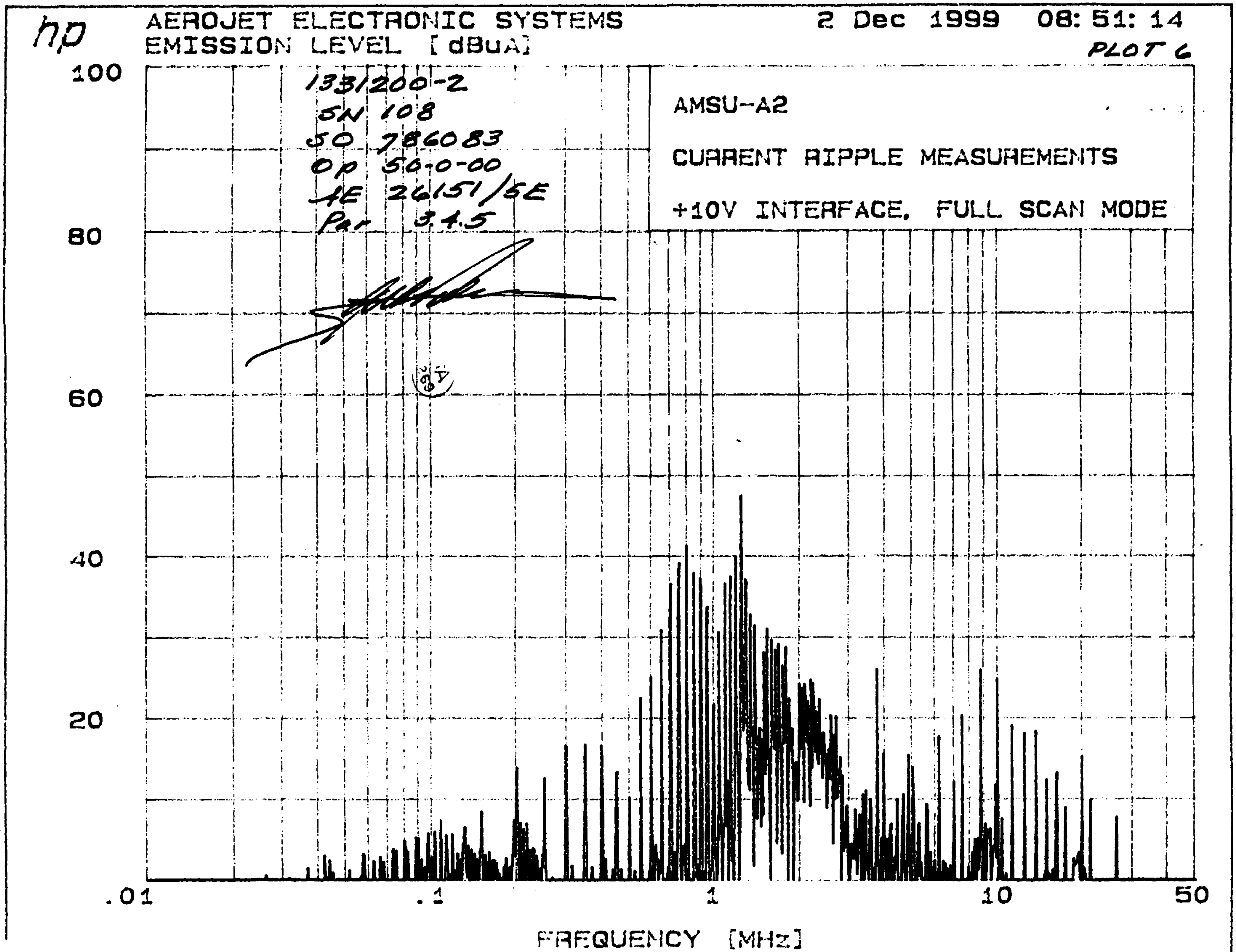
X=1.589kHz
Ya=-104.29 dBVrms
1 Dec 99
AMSU-A2
PLOT 3
POWER SPEC1
10Avg
0%Ovlp
Pulse Load Bus
Warm Cal mode
-40.0
10.0
/Div
dB
rms
V2
-120
133/200-2
SN 108
PO 786083
Op 50-0-00
LAB 26151/5E
Par 3.4.5
7A
269
80 dBμA p-p (10 mA p-p)
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k

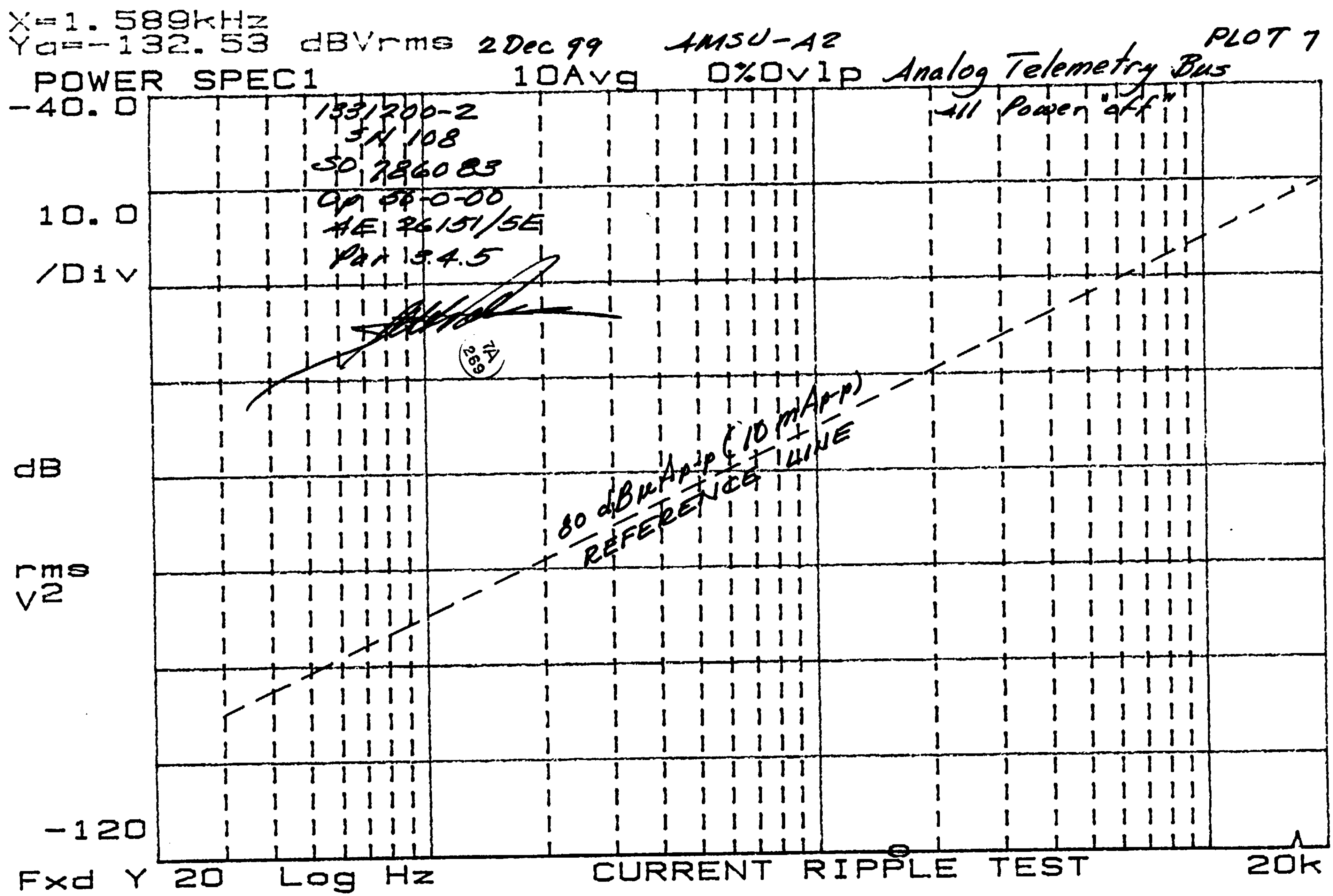


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
1 Dec 1999 14: 43: 12
PLOT 4
AMSU-A2
CURRENT RIPPLE MEASUREMENTS
PULSE LOAD BUS. WARM CAL MODE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151-5E
Par 3.4.5
TA 269
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]

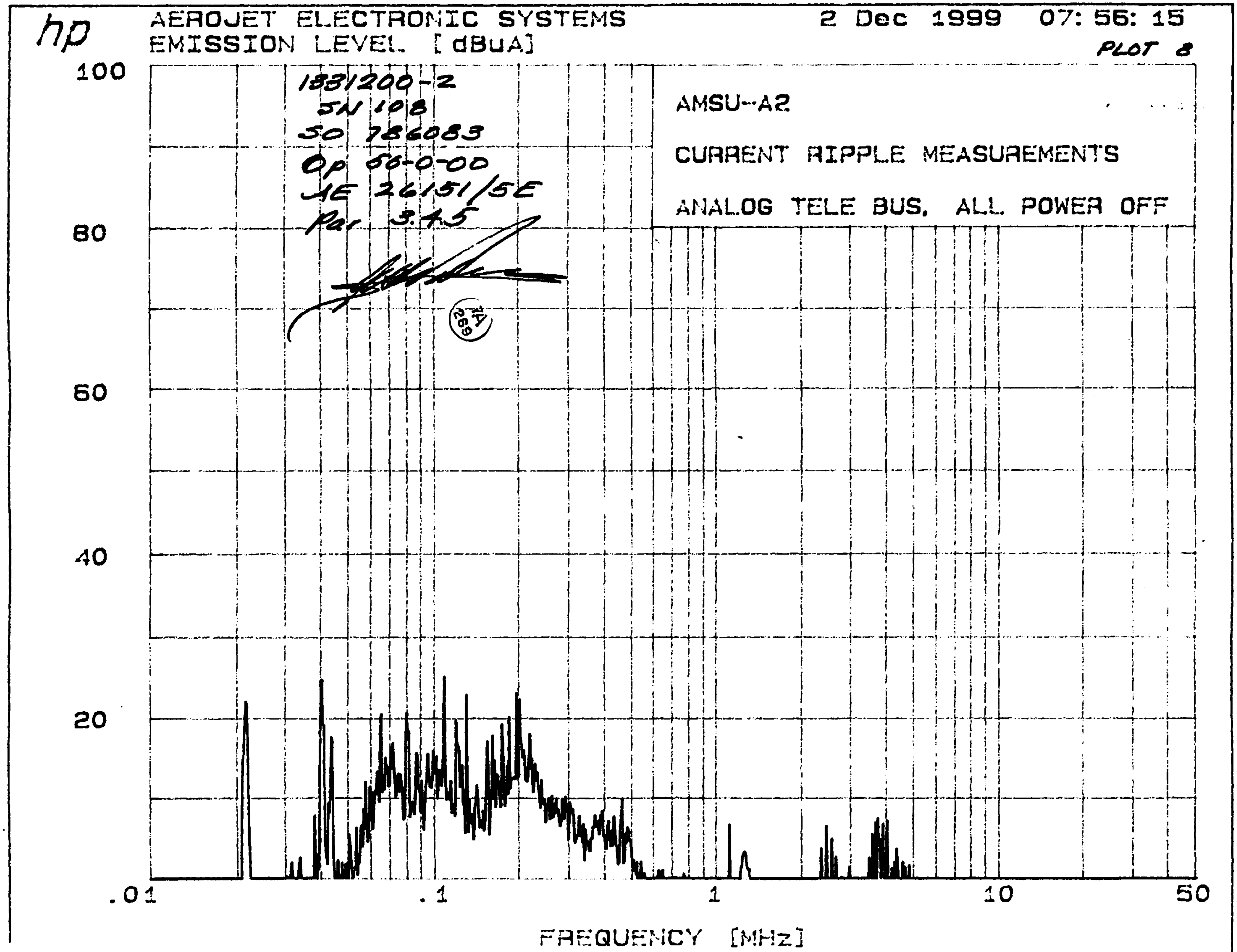


X=53.21 Hz
Ya=-144.33 dBVrms
2 Dec 99
AMSU-A2
PLOT 5
POWER SPEC1
10Avg
0%Ovlp
+10V Interface Bus
Full Scan Mode
-40.0
10.0
/Div
dB
rms
V2
-120
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/3E
Par 3.4.5
80 dBµA p-p (10 mA p-p)
REFERENCE LINE
Fxd Y 20 Log Hz
CURRENT RIPPLE TEST
20k

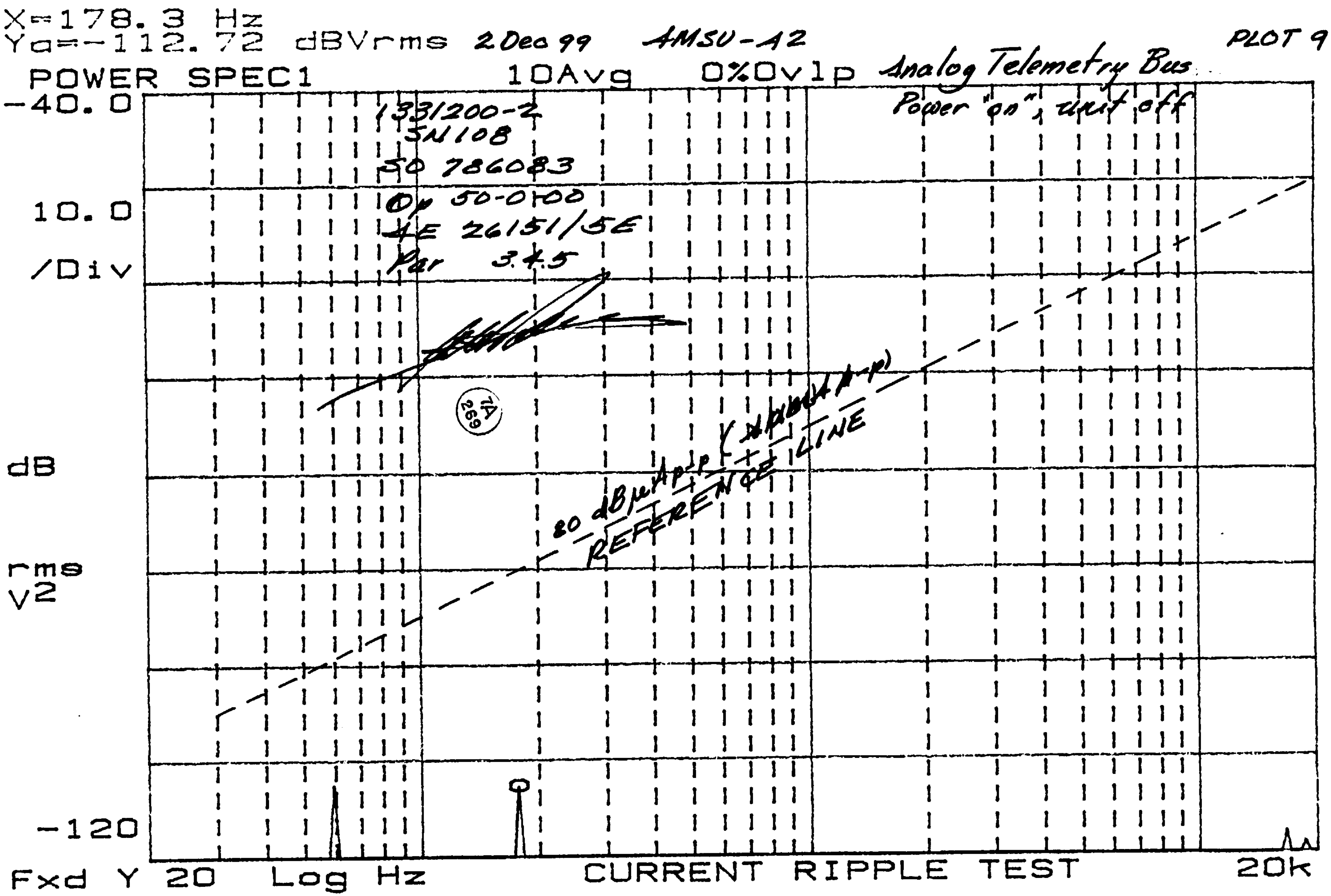

hp
AEROJET ELECTRONIC SYSTEMS
2 Dec 1999 08: 51: 14
EMISSION LEVEL [dBuA]
PLOT 6
133/200-2
SN 108
SO 786083
Op 56-0-00
AE 26151/SE
Par 3.4.5
AMSU-A2
CURRENT RIPPLE MEASUREMENTS
+10V INTERFACE, FULL SCAN MODE
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]



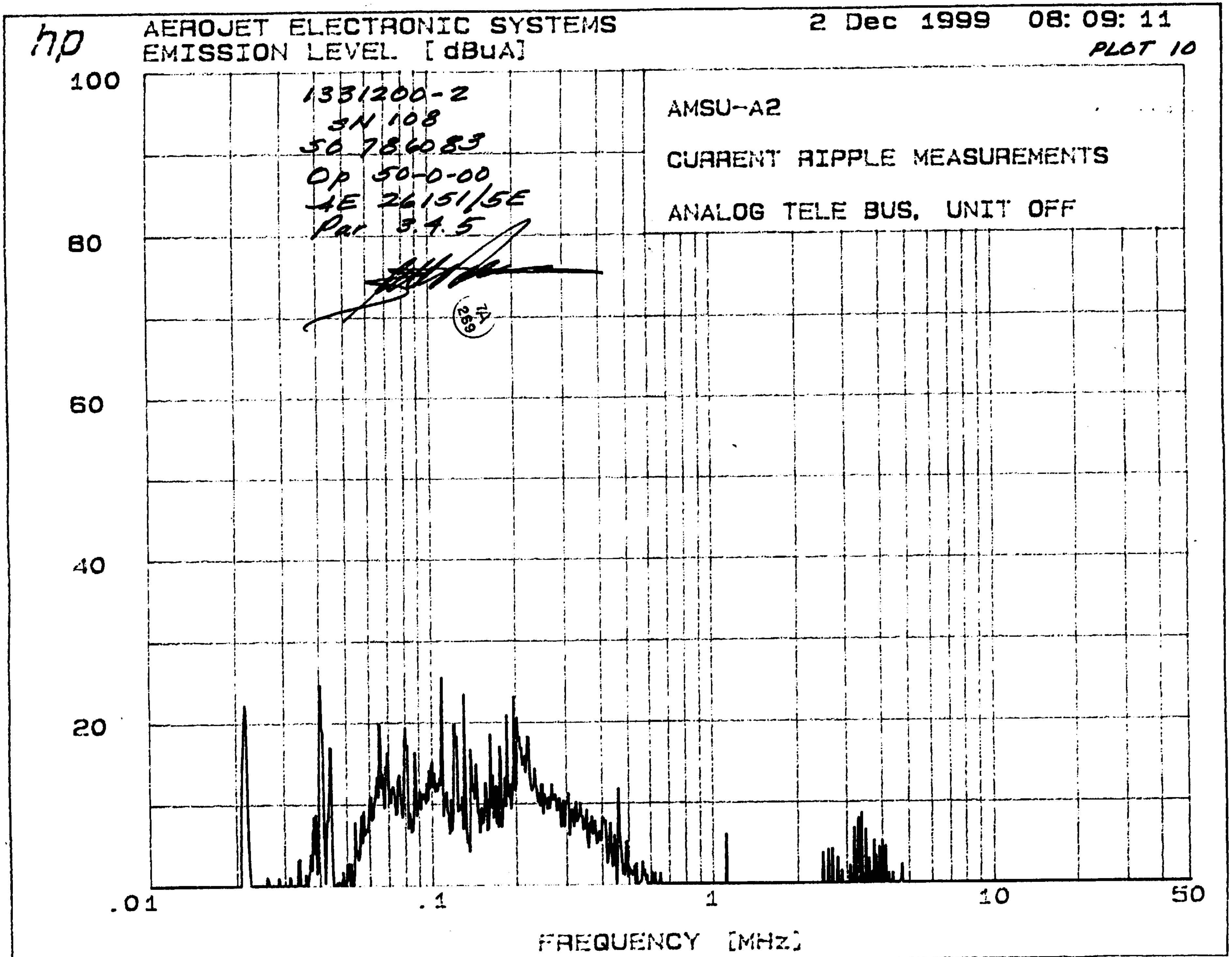
X=1.589kHz
Ya=-132.53 dBVrms
2 Dec 99
AMSU-A2
PLOT 7
POWER SPEC1
10Avg
0%Ovlp
Analog Telemetry Bus
All Power "off"
-40.0
10.0
/Div
dB
rms
V2
-120
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k
1331200-2
SN 108
SO 786083
Qp 98-0-00
HE 26151/5E
Par 3.4.5
7A
269
80 dBuAp-p (10 mAp-p)
REFERENCE LINE

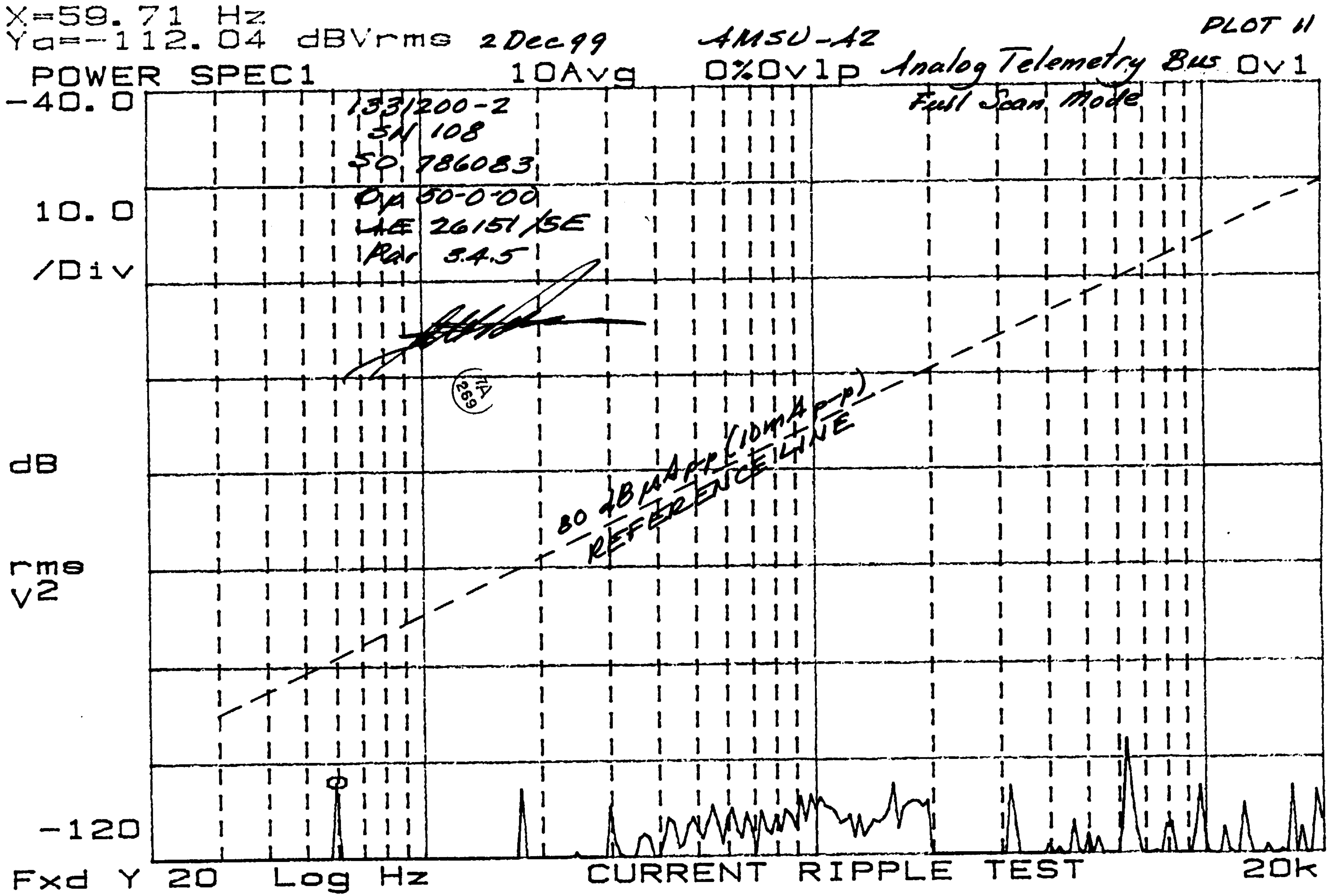


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
2 Dec 1999 07:56:15
PLOT 8
AMSU--A2
CURRENT RIPPLE MEASUREMENTS
ANALOG TELE BUS, ALL POWER OFF
1331200-2
SN 108
SO 786083
Op 60-0-00
AE 26151/5E
Par 3.4.5
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]

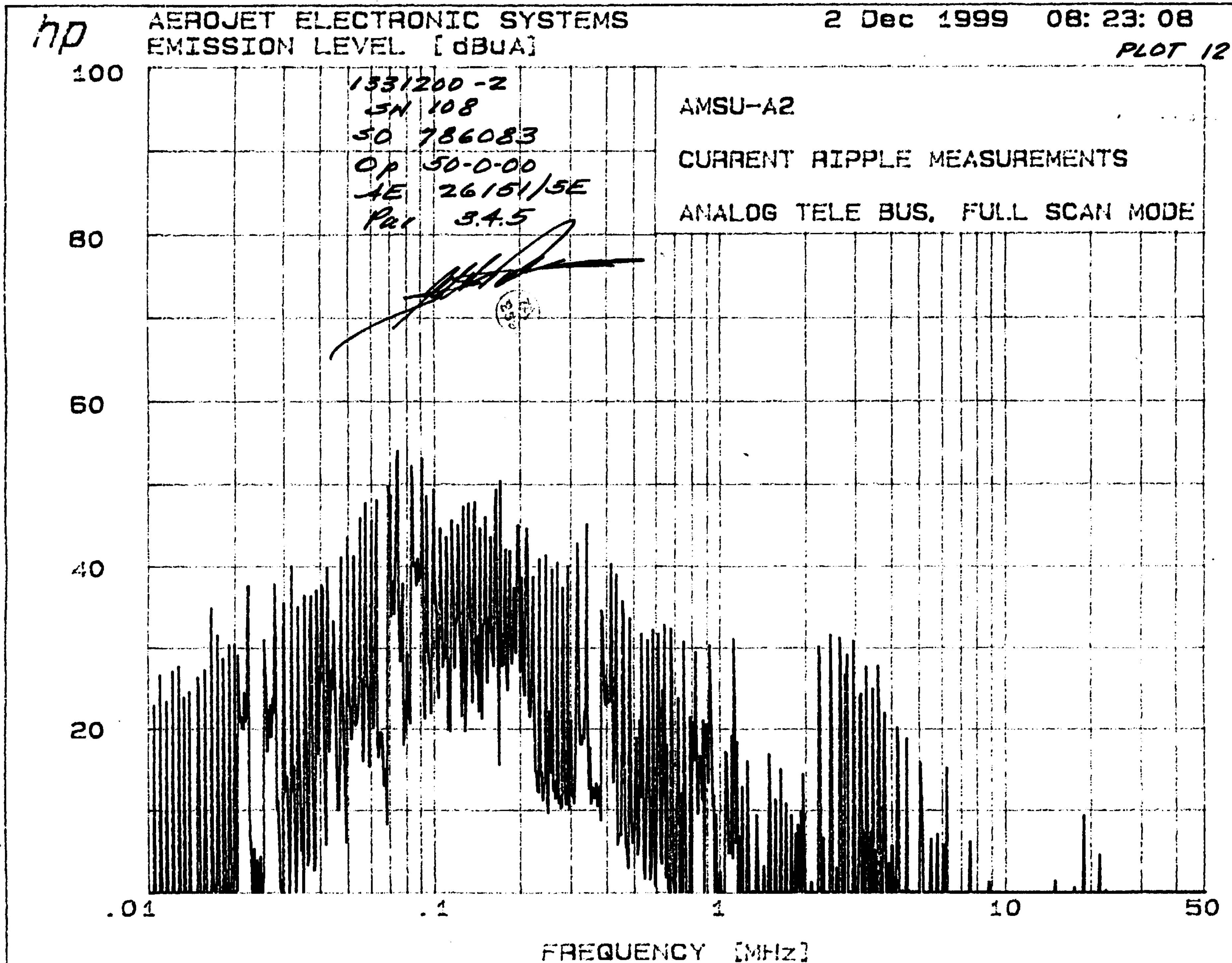


X=178.3 Hz
Ya=-112.72 dBVrms
2 Dec 99
AMSU-A2
PLOT 9
POWER SPEC1
10Avg
0%Ovlp
Analog Telemetry Bus
Power "on", unit off
-40.0
10.0
/Div
dB
rms
V2
-120
133/200-2
SN108
SO 786083
Op 50-0100
QE 26151/5E
Par 3.4.5
80 dBμAp-p
REFERENCE LINE
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k
7A
269


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
2 Dec 1999 08: 09: 11
PLOT 10
AMSU-A2
CURRENT RIPPLE MEASUREMENTS
ANALOG TELE BUS, UNIT OFF
1331200-2
SN 108
50 786083
Op 50-0-00
4E 26151/5E
Par 3.4.5
7A
269
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]



X=59.71 Hz
Ya=-112.04 dBVrms
2 Dec 99
AMSU-A2
PLOT 11
POWER SPEC1
10Avg
0%Ov1p
Analog Telemetry Bus
Ov1
Full Scan Mode
-40.0
10.0
/Div
dB
rms
V2
-120
Fxd Y 20
Log Hz
CURRENT RIPPLE TEST
20k
1331200-2
SN 108
SO 786083
Dia 50-0-00
LAE 26151/SE
Par 5.4.5
80 dBμA p-p (10mA p-p)
REFERENCE LINE
QA 269


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuA]
2 Dec 1999 08: 23: 08
PLOT 12
AMSU-A2
CURRENT RIPPLE MEASUREMENTS
ANALOG TELE BUS, FULL SCAN MODE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.5
100
80
60
40
20
.01
.1
1
10
50
FREQUENCY [MHz]

AEROJET ELECTRONIC SYSTEMS

1 Dec 99
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

7A
269

TEST SETUP TABLE	PG 1 OF 6

LIBRARY TEST FILE: SETUP NOT STORED

DISPLAY TITLE 1:	AMSU-A2
CONTROL PARAMETERS	
Test Type	PEAK
Freq Uncert (%)	1
Min Sweep Time/Oct (sec)	3
NUMBER PAGES NOTES	0
NUMBER RANGES	4
START FREQUENCY (MHz)	.010

RNG	STOP FREQ(MHz)	TRANSDUCER
1	.2	CURRENT PROBE 91550-2B S/N 774*
2	2.0	CURRENT PROBE 91550-2B S/N 774*
3	30.0	CURRENT PROBE 91550-2B S/N 774*
4	50.0	CURRENT PROBE 91550-2B S/N 774*

DISPLAY INFORMATION	PG 2 OF 6

AMPLITUDE INFO	
Units Label	dBuA
Disp Ref Level	100
TEST LIMITS	
Number Limits	0

AEROJET ELECTRONIC SYSTEMS

1 Dec 99
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

7A
269

==
RANGE 1: .010 TO .2 MHz PG 3 OF 6
==

AMPLIFIER	
Name	HP8447F OPT H64
Gain (dB)	28
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	300
Video Bandw. (Hz)	3000
Ref. Level (dBuV)	100
Int. Atten. (dB)	20
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	MESSAGE
Msg:	CONNECT CURRENT PROBE TO 28 dB GAIN INPT

==
RANGE 2: .2 TO 2.0 MHz PG 4 OF 6
==

AMPLIFIER	
Name	HP8447F OPT H64
Gain (dB)	28
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	1000
Video Bandw. (Hz)	10000
Ref. Level (dBuV)	100
Int. Atten. (dB)	20
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

AEROJET ELECTRONIC SYSTEMS

1 Dec 99
AMSU-A2
1331200-2
SN 108
30 786083
Op 50-0-00
AE 26151/c

7A
269

```
==========================================================
RANGE 3: 2.0 TO 30.0 MHz                        PG 5 OF 6
==========================================================
AMPLIFIER
  Name                    HP8447F OPT H64
  Gain (dB)                    28
INPUT PORT                    RIGHT
MSMT STATES
  QP Bandwidth (Hz)          BYPASS
  SA Res Bandw (Hz)           3000
  Video Bandw. (Hz)           30000
  Ref. Level (dBuV)            90
  Int. Atten. (dB)             20
  Ext. Atten. (dB)              0
NO. OF SETUPS                   1
NO. SWEEPS/SETUP                1
FIRST SETUP
  Msg,Sub,Continue          CONTINUE
```

```
==========================================================
RANGE 4: 30.0 TO 50.0 MHz                       PG 6 OF 6
==========================================================
AMPLIFIER
  Name                    HP8447F OPT H64
  Gain (dB)                    28
INPUT PORT                    RIGHT
MSMT STATES
  QP Bandwidth (Hz)          BYPASS
  SA Res Bandw (Hz)           3000
  Video Bandw. (Hz)           30000
  Ref. Level (dBuV)            90
  Int. Atten. (dB)             20
  Ext. Atten. (dB)              0
NO. OF SETUPS                   1
NO. SWEEPS/SETUP                1
FIRST SETUP
  Msg,Sub,Continue          CONTINUE
```

AEROJET ELECTRONIC SYSTEMS

1 Dec 99
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151

7A
269

TRANSDUCER TABLE

TRANSDUCER TITLE CURRENT PROBE 91550-2B S/N 774*
SIGN OF TRANSDUCER PLUS
NUMBER OF POINTS 45

POINT	FREQUENCY(MHz)	TRANSDUCER FACTOR
1	0.010000	-9.44
2	0.012340	-8.21
3	0.016708	-5.88
4	0.023198	-3.72
5	0.027230	-2.80
6	0.036871	-1.25
7	0.044031	-0.57
8	0.060091	0.36
9	0.070728	0.73
10	0.081365	0.98
11	0.112968	1.38
12	0.132605	1.51
13	0.156079	1.62
14	0.179552	1.70
15	0.214422	1.77
16	0.292627	1.87
17	0.344427	1.91
18	0.415464	1.94
19	0.492413	1.98
20	0.569362	2.00
21	0.674331	2.02
22	0.788640	2.05
23	0.916824	2.07
24	1.256440	2.10
25	1.488080	2.12
26	1.740332	2.12
27	2.023201	2.13
28	2.772647	2.14
29	3.283820	2.14
30	3.840477	2.14
31	4.464699	2.14
32	5.291619	2.12
33	6.118539	2.11
34	7.246570	2.10
35	8.474970	2.08
36	9.852472	2.06
37	11.677278	2.03
38	13.502084	2.01
39	15.991365	1.98
40	18.702138	1.95
41	22.748663	1.90
42	26.775552	1.83
43	30.802441	1.64
44	42.766435	2.02
45	50.200602	1.92

AE-26151/5E
11 Feb 99

TEST DATA SHEET 1 (Sheet 1 of 1)
3.4.5: CE01/CE03 Test Ref. Current Ripple Test 2 Dec 99

Test Setup Verified: K. Hair 12/1/99
Signature

3.4.5.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date
Oscilloscope	Tek	TDS380	C200083	3-4-99	1-4-01
Current Probe	Tek	46302	C200182	2-5-99	7-5-01
Current Probe Amp	Tek	TM5024	C200183	2-5-99	7-5-01
Power Supply	PDS	36505	41914	6-24-99	6-24-01

3.4.5.3.2: Time Domain ~~Emission Measurements, 30 Hz to 20 kHz, (DM)~~ e 2 Dec 99

Step	Power Line	Band	Required	Emissions within limits? Yes	No	Mode Comments/ Observations	Plot
4	+28V Main Bus	Narrow	See Figures 2 & 3	✓ ✓		Inst. Off Full Scan	1 & 2 3
~~4~~	~~28V Main Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e				
7	+28V Telemetry Bus	Narrow	See Figures 2 & 3	✓ ✓		Inst Off Full Scan	7 & 8 9
~~7~~	~~28V Telemetry Bus Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e				
7	+28V PLB	Narrow	See Figures 2 & 3	✓ ✓		Inst Off Warm Cal	4 & 5 6
~~7~~	~~28V PLB Rtn~~	~~Narrow~~	~~See Figures 2 & 3~~ e				
7	+10V Interface Bus	Narrow	See Figures 2 & 3	✓ ✓		Inst Off Full Scan	10 11
~~7~~	~~10V Interface Bus Ret~~	~~Narrow~~	~~See Figures 2 & 3~~ e				
~~7~~	~~Safety Heater~~	~~Narrow~~	~~See Figure 4~~ e				
~~7~~	~~Safety Heater Return~~	~~Narrow~~	~~See Figure 4~~ e				

2 Dec 99

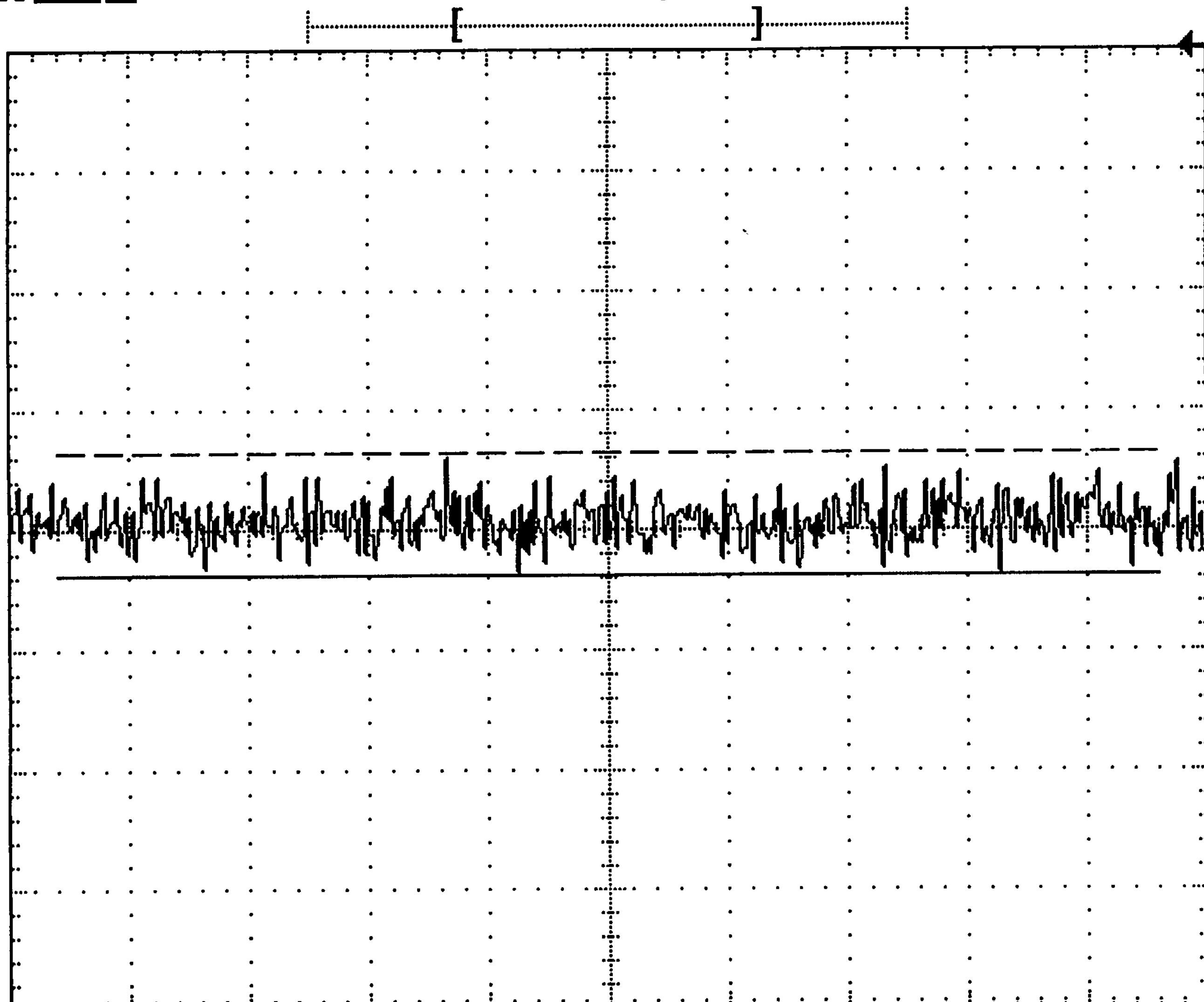
NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comments or observations, etc.) to this data sheet.

Signature/Date

Unit AMSU-A2 1331200-2
Engineer: 2 Dec 99
Serial No. 108
DEC 0 2 1999
Quality Control: Judia Harvey QA 259
Shop Order 786083 Oper 50-0-00
Customer Representative: 12-3-99

Tek Stop: 500 S/s 1 Acqs

PLOT 1



Δ: 10.2mV
@: −2.2mV

Ch1 Pk−Pk
10.4mV

Main Load Bus
~~Pulse Load Bus~~ off
All Power "off" 2Dec99

CPAmp: 1mA/Div

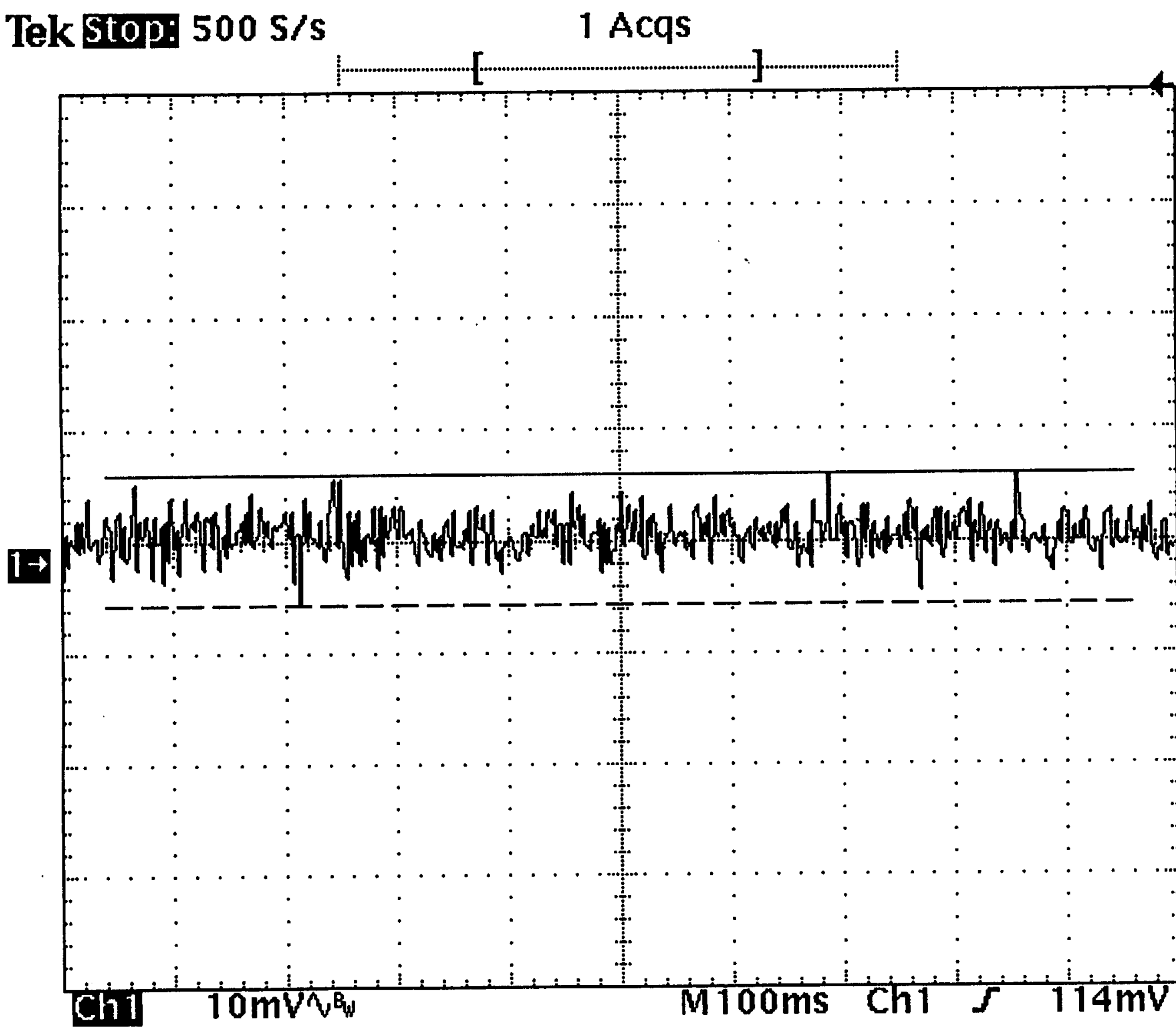
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

7A
269

Ch1 10mV $\mathrm{B_W}$ M100ms Ch1 ∫ 114mV

1 Dec 1999
13:51:05

PLOT 2



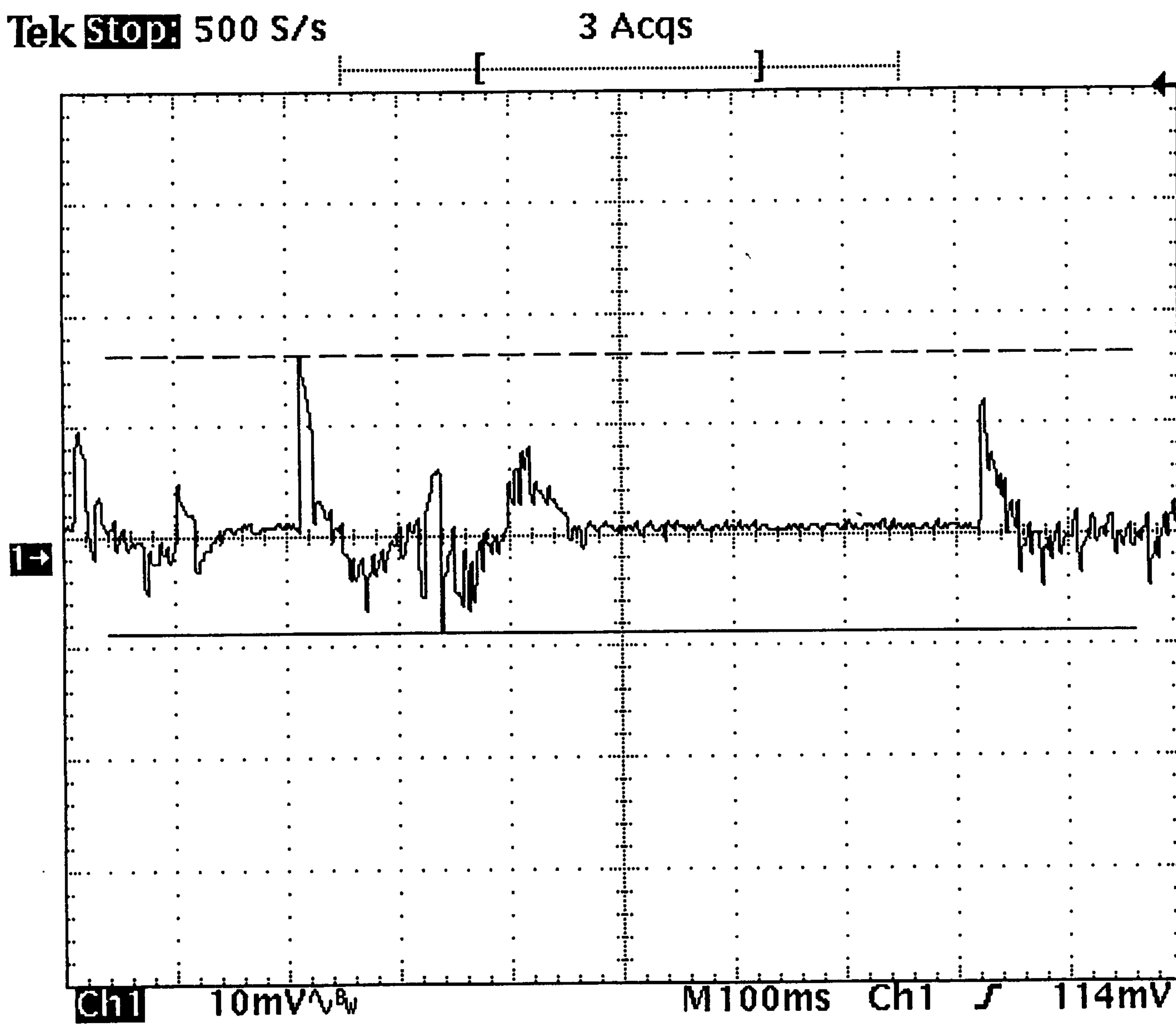
Δ: 11.6mV
@: 7.6mV

Ch1 Pk–Pk
11.6mV

Main Load Bus
Power "on", Unit "off"
CP Amp: 1mA/Div

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

1 Dec 1999
13:54:28



PLOT 3

Δ: 25.2mV
@: −7.2mV

Ch1 Pk−Pk
25.2mV

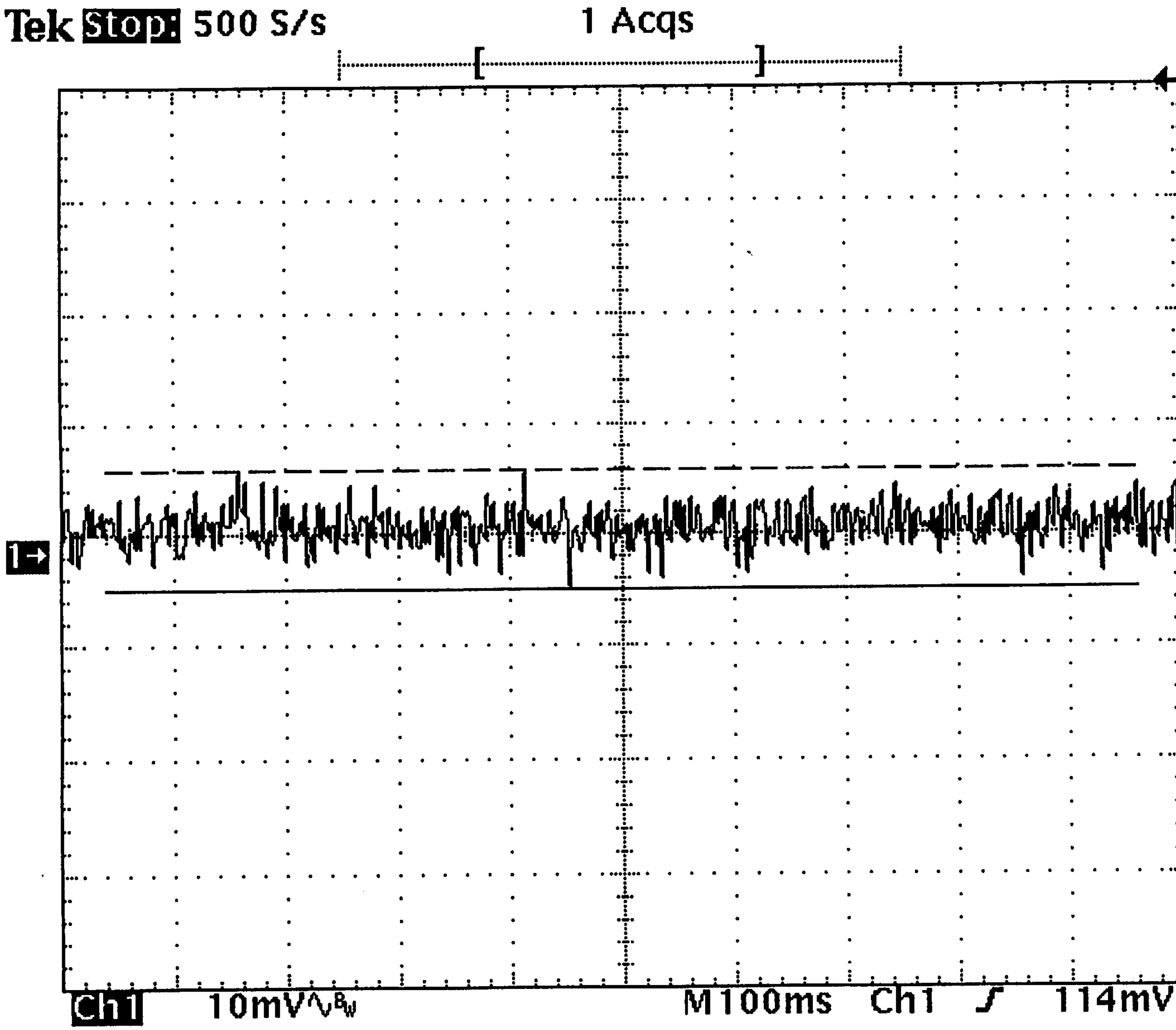
Main Load Bus
Full Scan Mode
CPAmp: 20 mA/Div.

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

-7A
269

1 Dec 1999
14:05:28

PLOT 4



Δ: 10.8mV
@: −3.4mV

Ch1 Pk−Pk
10.8mV

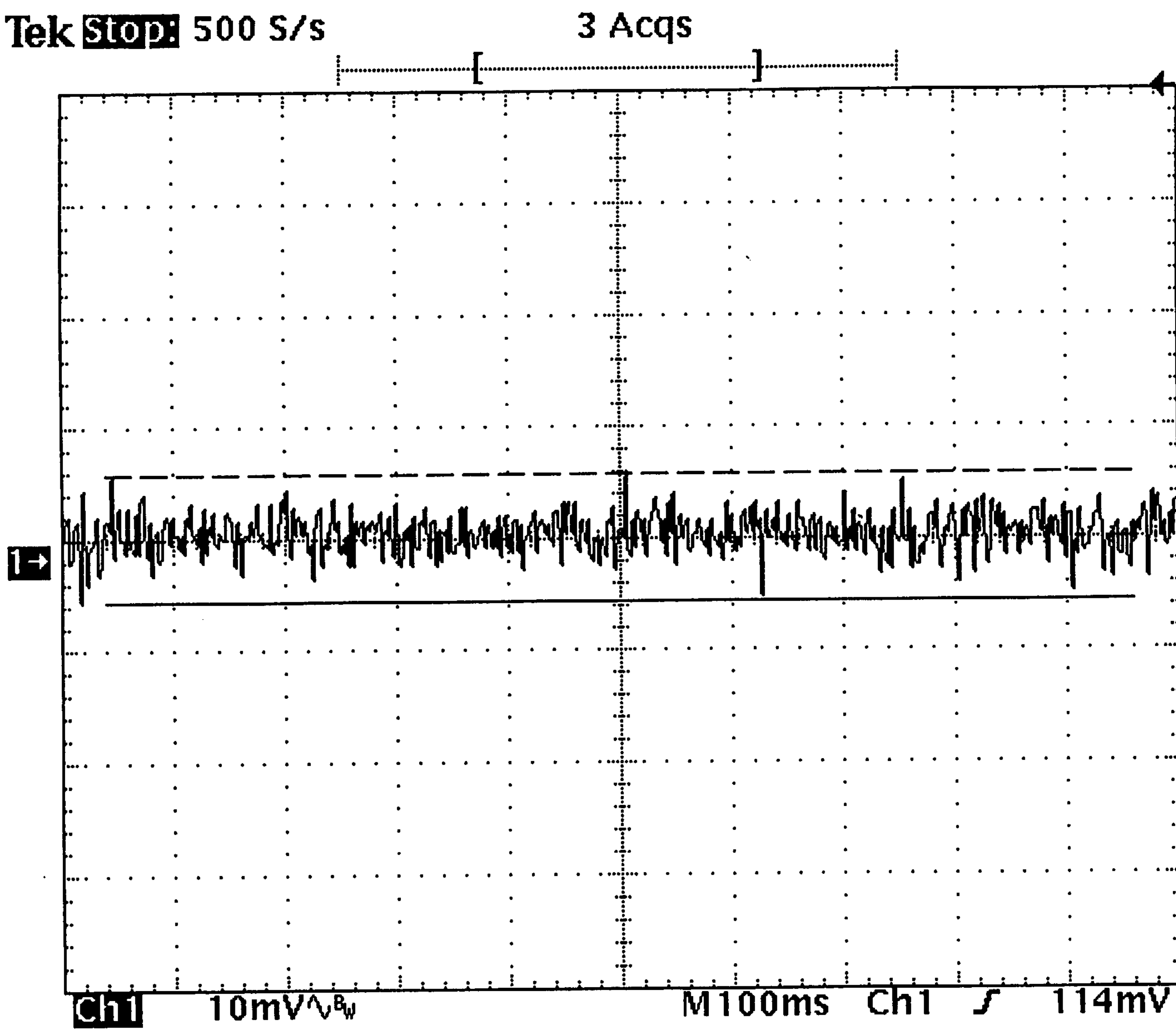
Pulse Load Bus
All power "off"
CP Amp: 1 mA/Div

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
TE 26151/5E
Par 3.4.5

7A
269

1 Dec 1999
14:25:53

PLOT 5



Δ: 11.4mV
@: −4mV

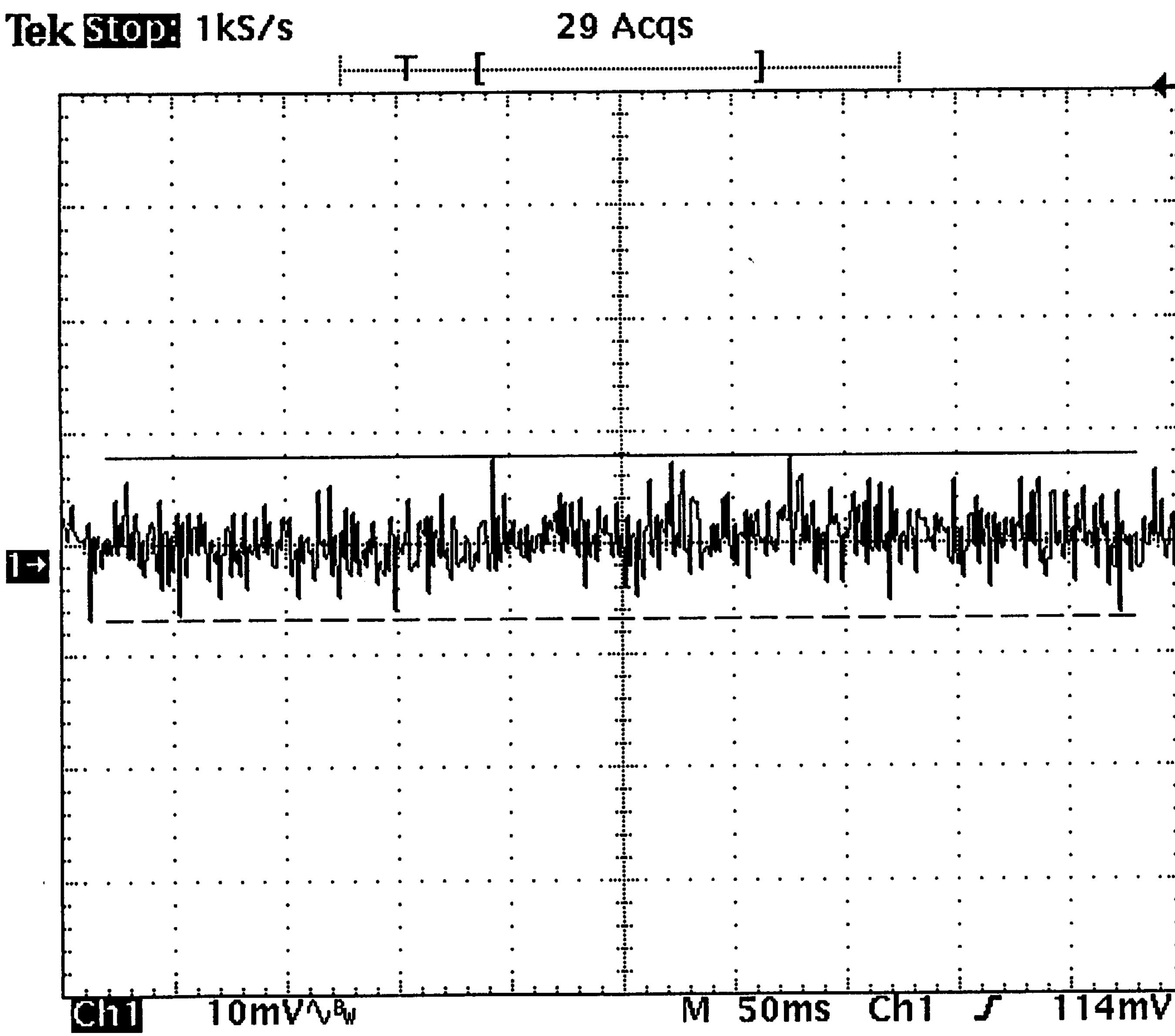
Ch1 Pk−Pk
11.6mV
Pulse Load Bus
Power "on", Unit "off"
CP Amp: 1 mA/Div.

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.5

A 269

1 Dec 1999
14:29:28

PLOT 6



Δ: 14.6mV
@: 9.4mV

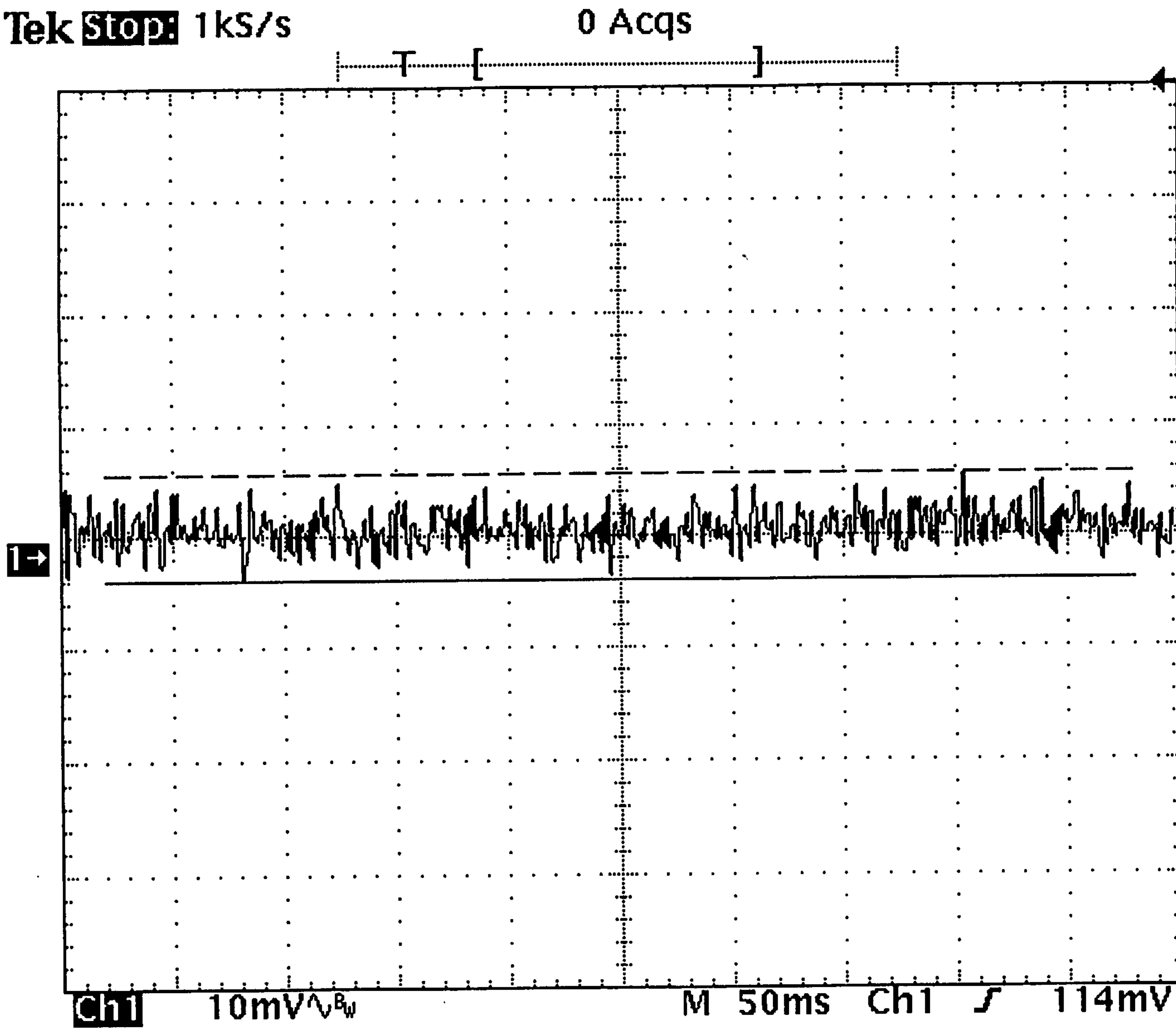
Ch1 Pk–Pk
15.2mV

Pulse Load Bus
Warm Cal Mode
CPAmp: 10 mA/Div

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

1 Dec 1999
14:37:57

PLOT 7



Δ: 9.6mV
@: −2.4mV

Ch1 Pk−Pk
9.6mV

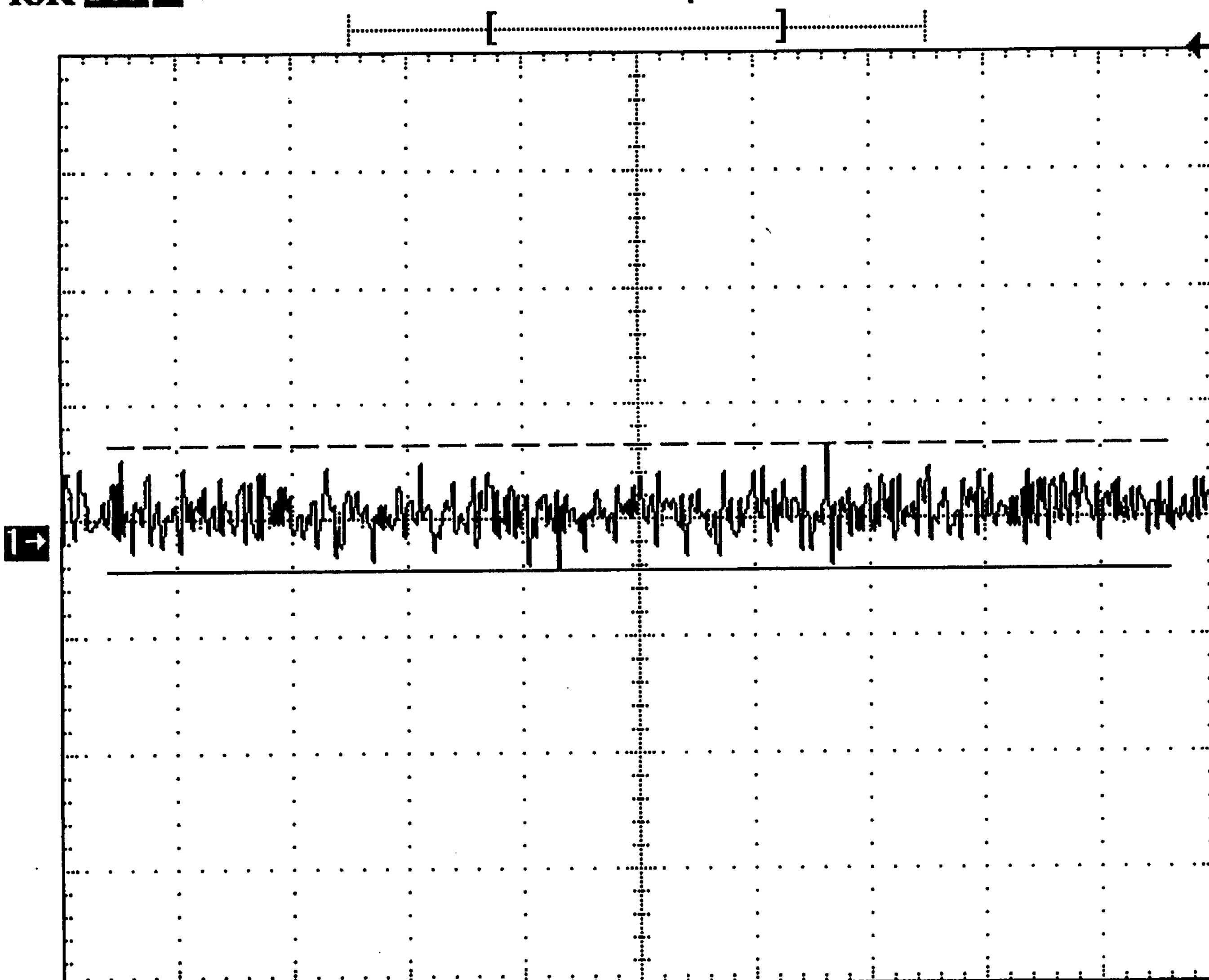
Analog Telemetry Bus
All Power "Off"
CP Amp: 1mA/Div

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

7A
269

2 Dec 1999
07:51:59

Tek Stop: 500 S/s 1 Acqs



Ch1 10mV $\sim$ BW M100ms Ch1 ⨍ 114mV

PLOT 8

Δ: 10.8mV
@: −2.8mV

Ch1 Pk−Pk
10.8mV

Analog Telemetry Bus
Power "On", Unit "Off"
CPAmp: 1mA/Div

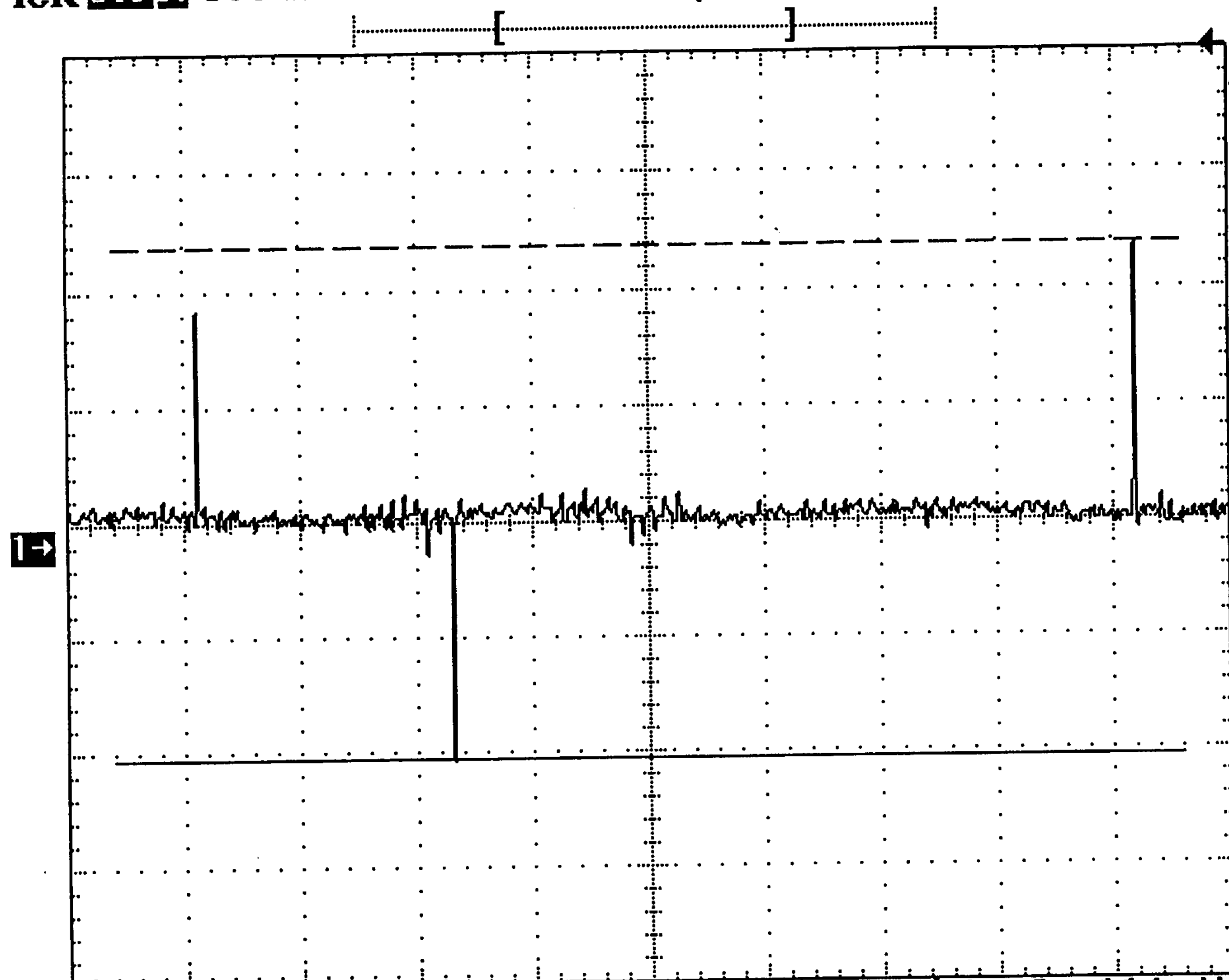
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

7A 269

2 Dec 1999
08:05:20

Tek Stop: 500 S/s   15 Acqs

PLOT 9



Δ: 44.4mV
@: −19mV

Ch1 Pk−Pk
44.4mV

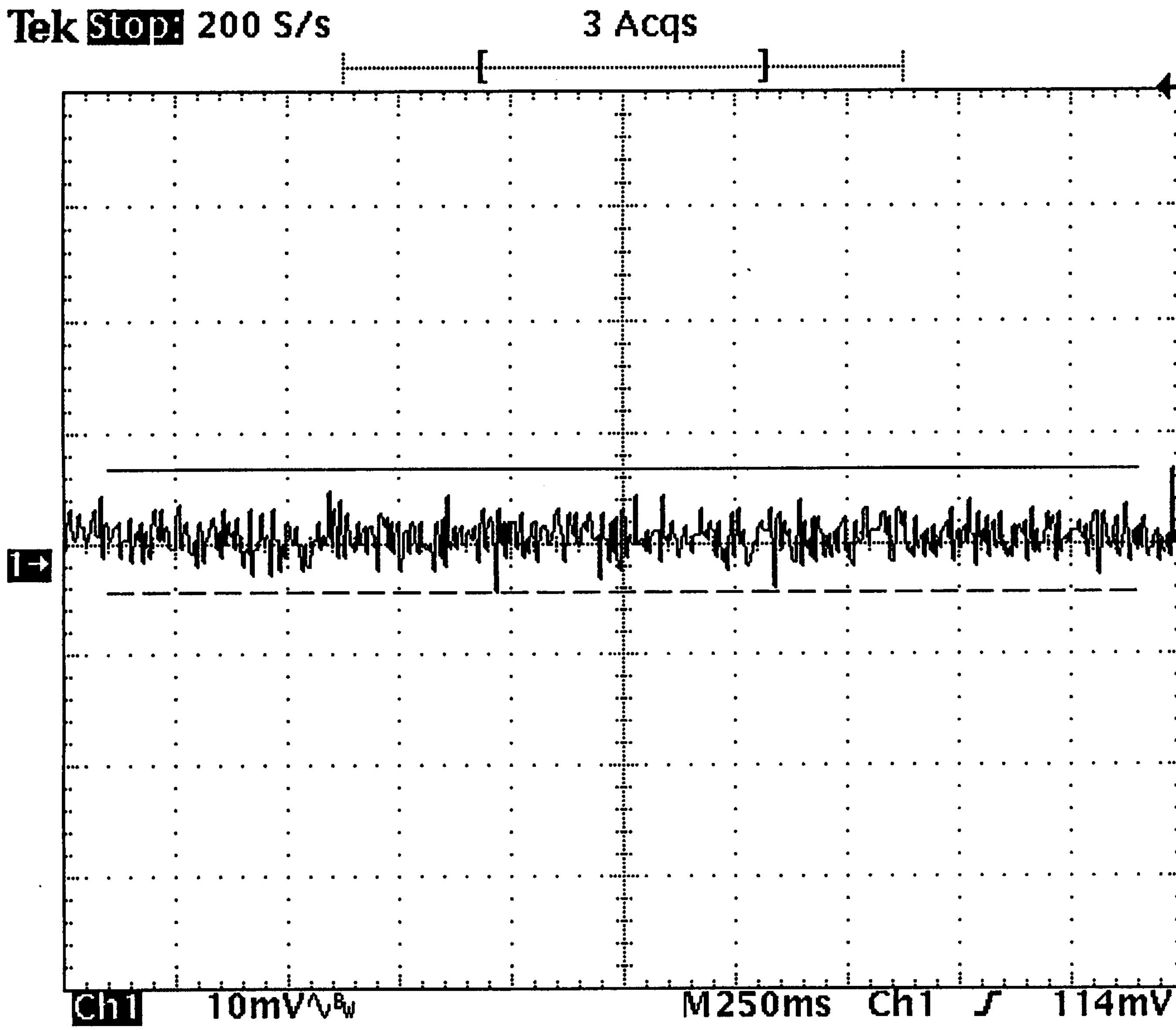
Analog Telemetry Bus
Full Scan Mode
CP Amp: 5mA/Div

Ch1 10mV BW   M100ms Ch1 ∫ 114mV

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50000
AE 26151/5E
Par 3.4.5

2 Dec 1999
08:19:53

PLOT 10



Δ: 11.2mV
@: 8.4mV

Ch1 Pk–Pk
11.2mV

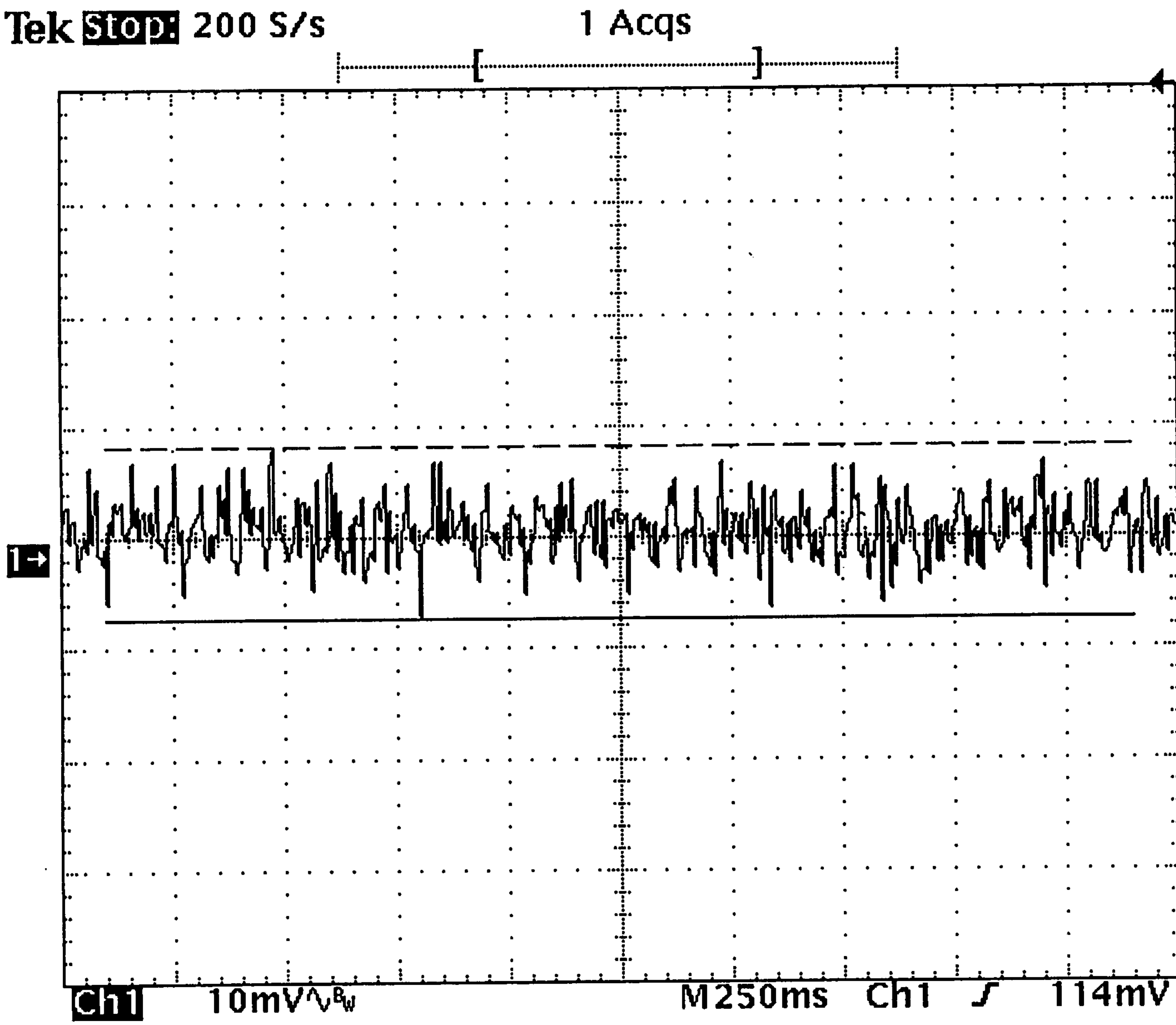
+10V Interface Bus
Power "On", unit "off"
CP Amp: 1mA/Div.

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

TA 269

2 Dec 1999
08:42:42

PLOT 11



Δ: 15.6mV
@: −5.8mV

Ch1 Pk−Pk
15.6mV

+10V Interface Bus
Full Scan Mode
CP Amp: 1 mA / Div

AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.5

7A
269

2 Dec 1999
08:45:50

TEST DATA SHEET 2 (Sheet 1 of 3)
3.4.6: RE02 Test

Test Setup Verified: R. Hirt
Signature

3.4.6.3.1 Step 1: Test Equipment Log

Item	Manufacturer	Model/ Part No.	Aerojet Inventory No.	Calibration Date	Calibration Due Date
Signal Analyzer	HP	70004A	55447	10-19-99	5-19-00
Plotter	HP	7470A	57760	CNR	CNR
Spectrum Analyzer	HP	8566B	54861	11-20-99	6-20-00
Plotter	HP	7475A	47417	CNR	CNR
Biconical Antenna	EMCO	3110B	55361	11-11-99	11-11-00
Biconical Antenna	EMCO	93110,	C200204	2-24-99	2-24-00
Double Ridged Guide Ant	Electro Metrics	RGA180	L508857	11-11-99	11-11-00
Log Spiral Ant	Electro Metrics	LCA25	L58358	2-25-99	2-25-00
Active Rod Antenna	EMCO	3301B	55363	1-7-99	1-7-00
Computer	HP	9836	46134-15	CNR	CNR
~~Plotter~~ 1/12/99 Printer	HP	2671G	07202	CNR	CNR
Microwave Amplifier	HP	8449B	C200203	8-9-99	7-16-00
Amplifier	HP	8447F Opt H64	C200280	9-15-99	1-15-01

TEST DATA SHEET 2 (Sheet 2 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: ______________________
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna/Frequency	Band	Required	Emissions within limits? Yes	No	Comments/ Observations Plot
4	All except Horn 14 kHz to 1 GHz	Narrow	See Figure 6	✓		52 & 53
~~6~~	~~All except Horn 14 kHz to 1 GHz~~ 12/1/99	~~Broad~~	~~See Figure 7~~			
12	Horn, RGA-180 1 to ~~2~~ 10 GHz 12-1-99	Narrow	See Figure 6	✓		54 & 55
15	Biconical, EMCO 3104 121.5 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm	✓		7 & 8
16	Log Conical, EMCO 3101 243 MHz, 401.65 MHz, & 406.05 MHz with Ampl	Narrow	No narrow-band freq. > -150 dBm	✓		18, 25, & 31
19	Horn, RGA-180 2010 to 2040 MHz with Ampl	Narrow	No narrow-band freq. > -120 dBm	✓		34 & 35
21	Biconical/Log Conical 59.458 to 751.944 MHz	Narrow	No narrow-band freq. > -60 dBm	✓		36 thru 51
21	400 to 500 MHz	Narrow	-107.1dBm	✓		58
21	10 ~~2~~ to 18 GHz 12-1-99	Narrow	Figure 3	✓		56 & 57
21	1217 to 1227 MHz	Narrow	-111.8 dBm	✓		59 & 60 12-1-99
21	1565 to 1614 MHz	Narrow	-111.2 dBm	✓		61 & 62
21	2051.9 to 2055 MHz	Narrow	-126.7 dBm	✓		63 & 64
21	5254.7 to 5255.3 MHz	Narrow	-122.8 dBm	✓		65 & 66
21	5450 to 5825 MHz	Narrow	-80.7 dBm	✓		67 & 68

NOTE: Attach all backup data generated during the test (photos, printouts, plots, test logs, additional comment or observations, etc.) to this data sheet.

TEST DATA SHEET 2 (Sheet 3 of 3)
3.4.6: RE02 Test (Cont)

Test Setup Verified: R. Neis
Signature

3.4.6.3.2: Emission Measurements

Step	Antenna*/Frequency Range (MHz)	Band	Radiation Limit (dBm)	Emissions within limits?		Comments/ Observations
				Yes	No	Plot
22	118.000 - 120.000	Narrow	-100 / Table IV	✓		1 & 2
22	120.000 -121.450	Narrow	-125 / Table IV	✓		3 & 4
22	121.450 - 121.485	Narrow	-145 / Table IV	✓		5 & 6
22	121.515 - 121.550	Narrow	-145 / Table IV	✓		9 & 10
22	121.550 - 123.000	Narrow	-125 / Table IV	✓		11 & 12
22	123.000 - 125.000	Narrow	-100 / Table IV	✓		13 & 14
23	236.000 - 240.000	Narrow	-100 / Table IV	✓		15
23	240.000 - 242.925	Narrow	-125 / Table IV	✓		16
23	242.925 - 242.975	Narrow	-145 / Table IV	✓		17
23	243.025 - 243.075	Narrow	-145 / Table IV	✓		19
23	243.075 - 246.000	Narrow	-125 / Table IV	✓		20
23	246.000 - 250.000	Narrow	-100 / Table IV	✓		21
23	385.100 - 401.100	Narrow	-100 / Table IV	✓		22
23	401.100 - 405.900	Narrow	-125 / Table IV	✓		23
23	405.900 - 406.000	Narrow	-145 / Table IV	✓		24
23	406.1 00 - 406.200	Narrow	-145 / Table IV	✓		26
23	406.200 - 411.00	Narrow	-125 / Table IV	✓		27
23	411.000 - 425.000	Narrow	-100 / Table IV	✓		28
23	396.000 - 401.500	Narrow	-125 / Table IV	✓		29
23	401.500 - 401.600	Narrow	-145 / Table IV	✓		30
23	401.700 - 401.800	Narrow	-145 / Table IV	✓		32
23	401.800 - 406.000	Narrow	-125 / Table IV	✓		33

* All frequency ranges are to be performed with antenna in both vertical and horizontal polarization.

Signature/Date

Unit AMSU-A2 1331200-2

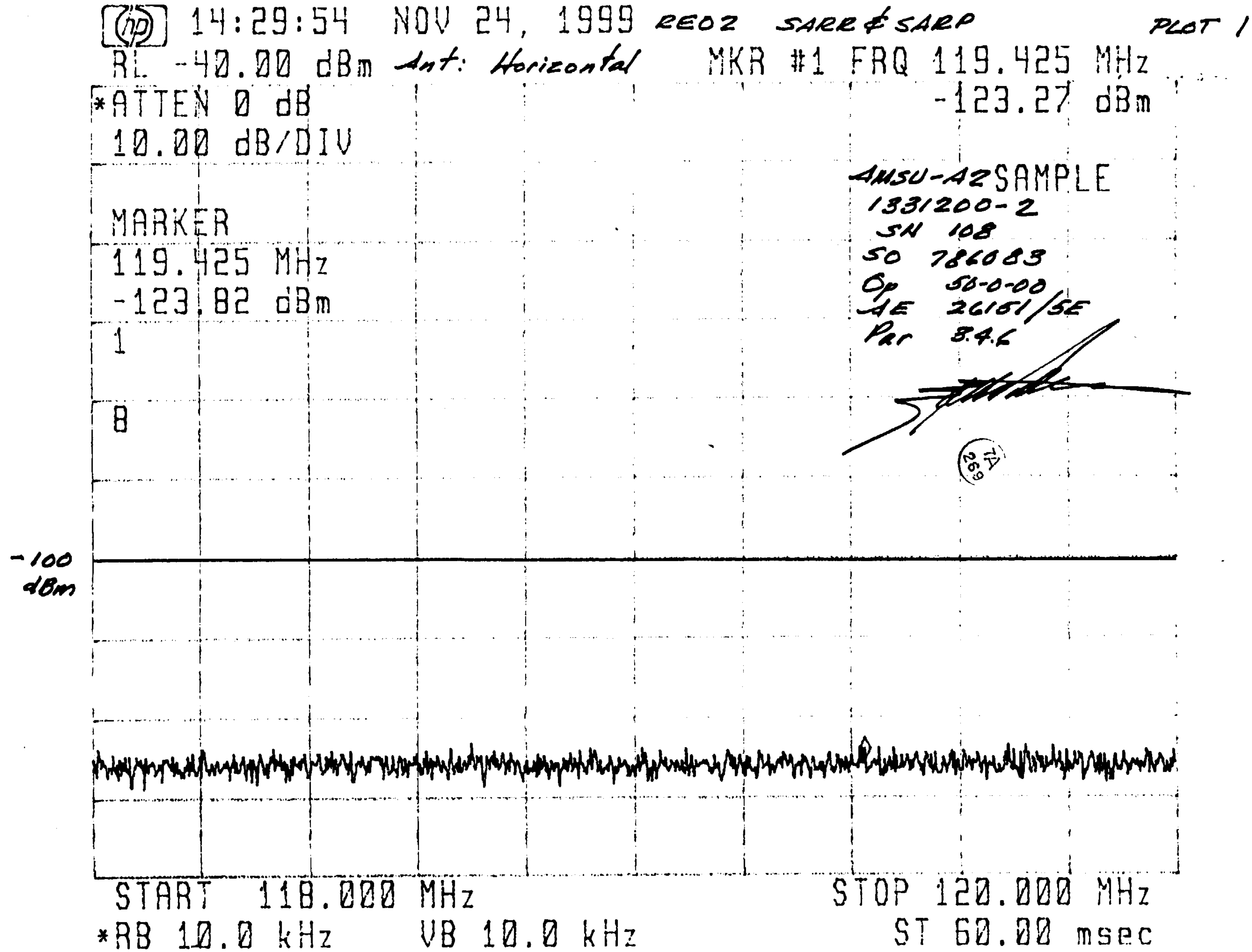
Serial No. 108

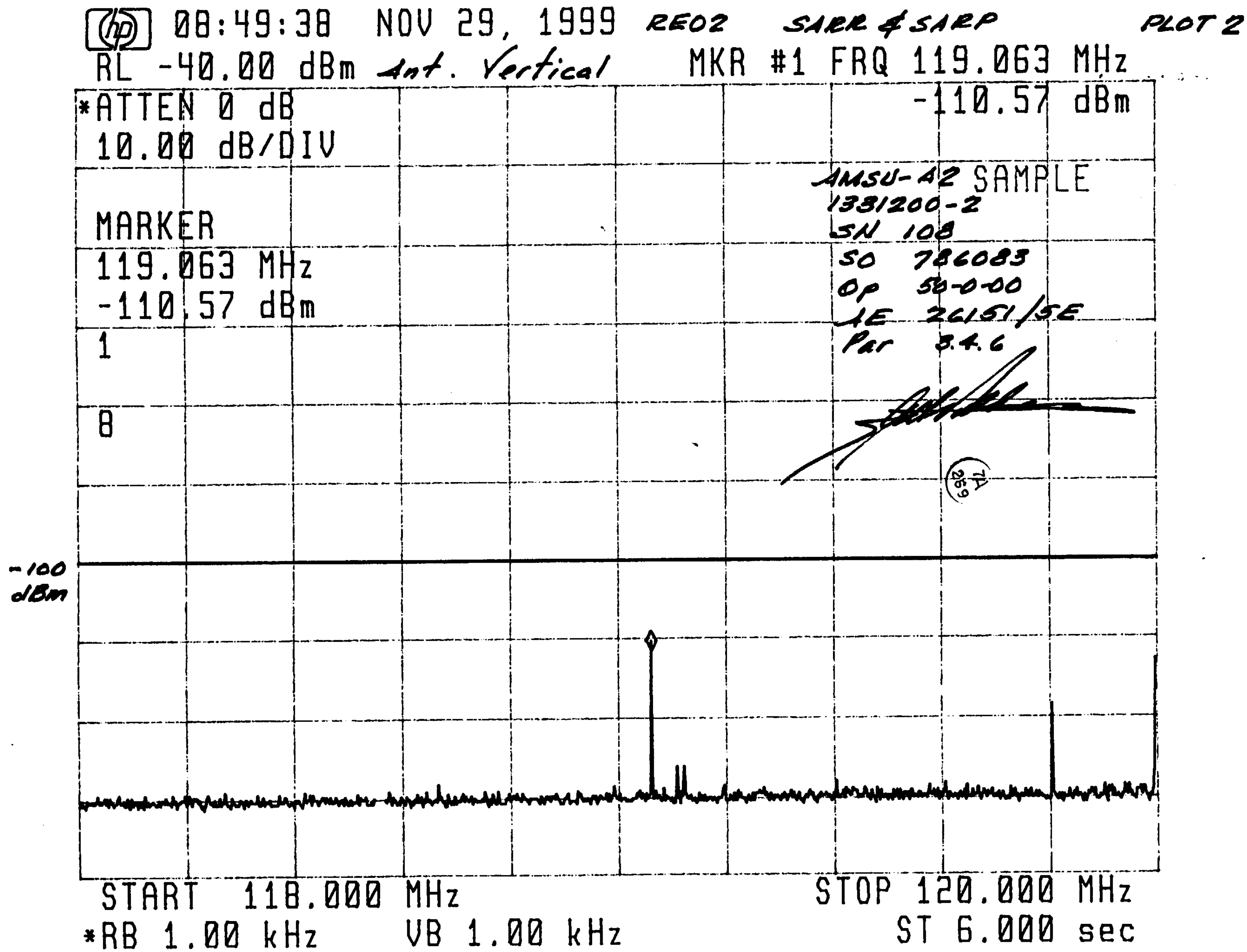
Shop Order 786083 Oper 500-00

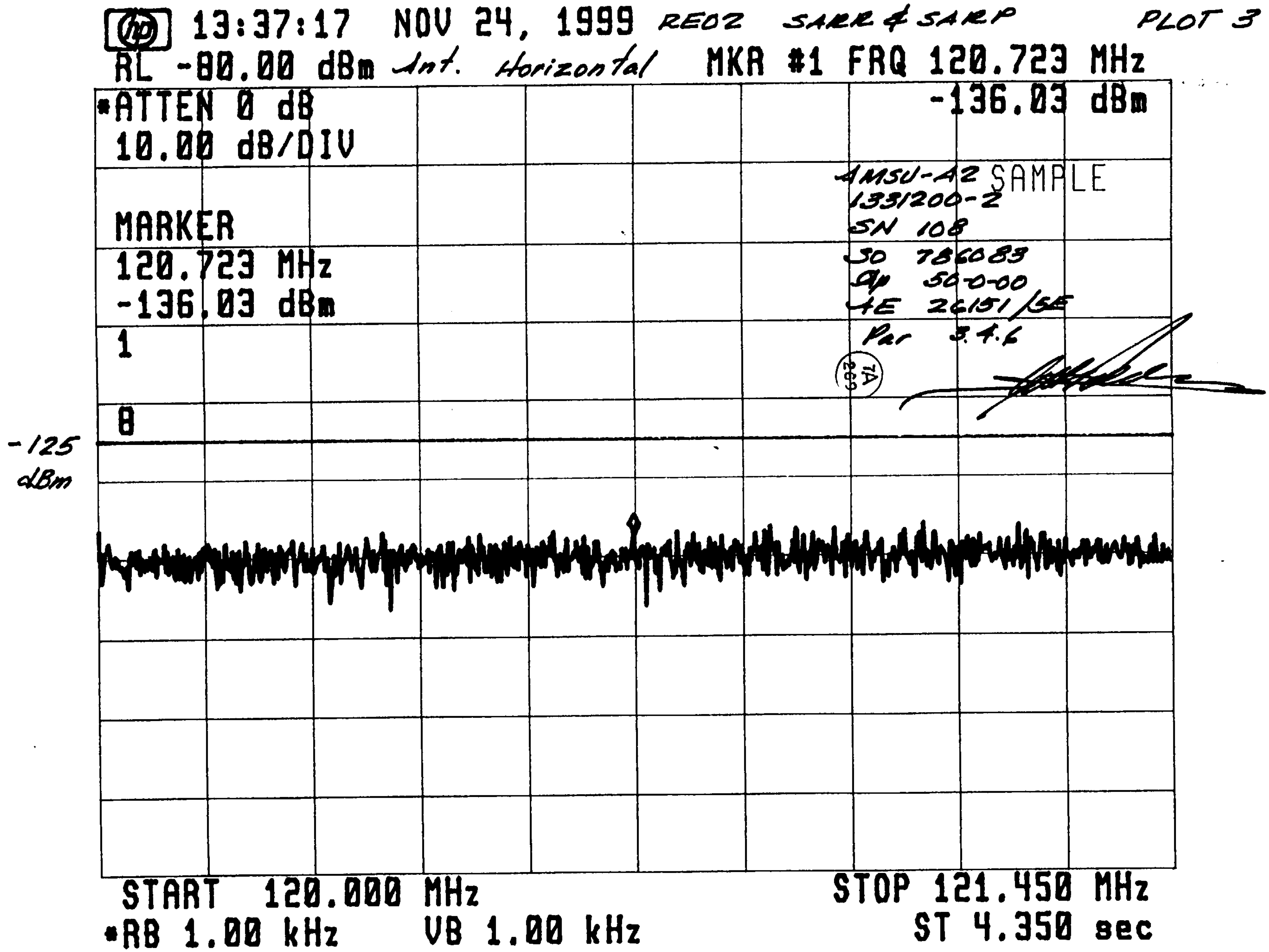
Engineer: [signature] 12/1/99

Quality Control: [signature] 02 DEC 99

Customer Representative: [signature] 12/2/99

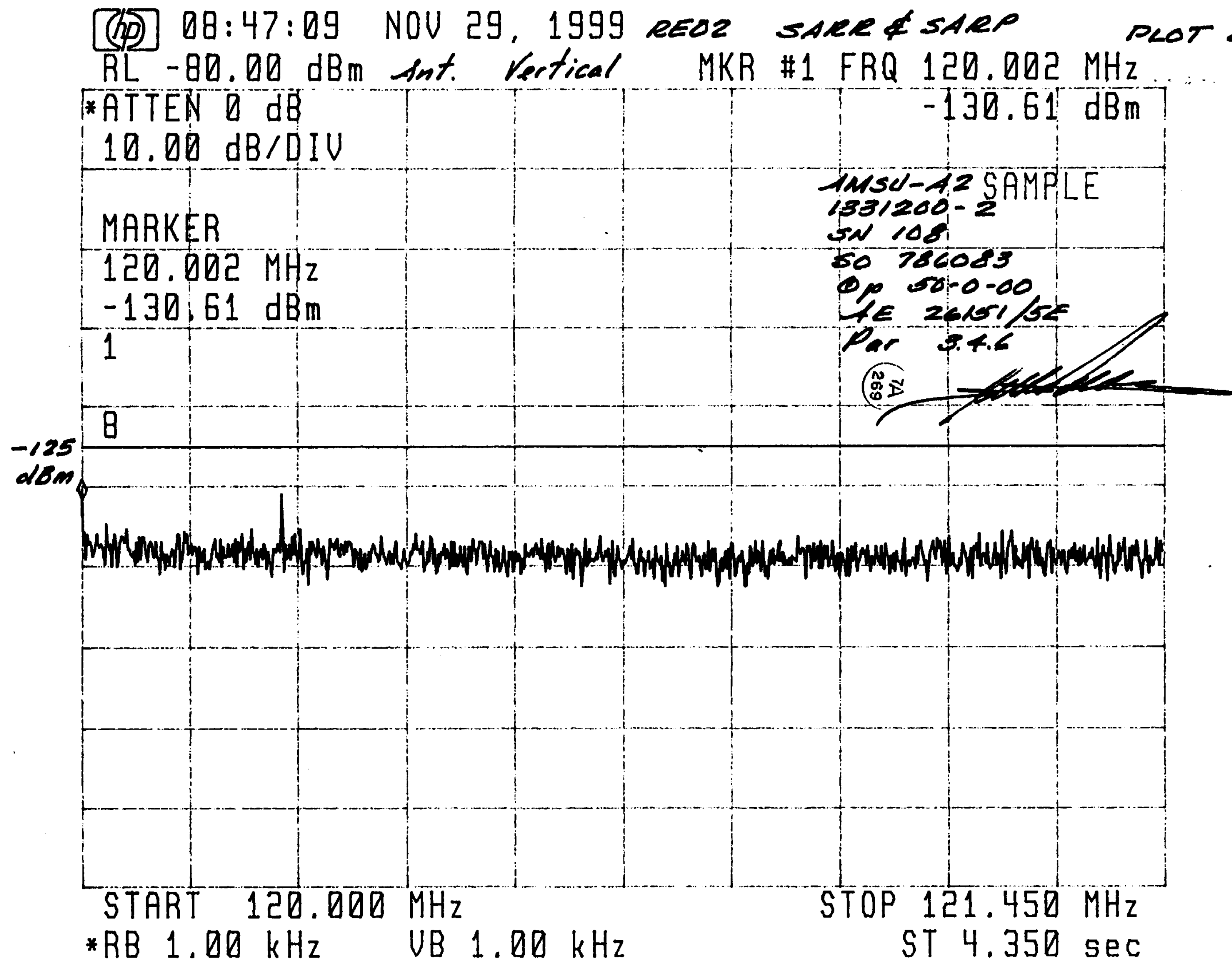

14:29:54 NOV 24, 1999 RE02 SARR & SARP
PLOT 1
RL -40.00 dBm Ant: Horizontal
MKR #1 FRQ 119.425 MHz
-123.27 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
119.425 MHz
-123.82 dBm
1
B
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
7A 269
-100 dBm
START 118.000 MHz
STOP 120.000 MHz
*RB 10.0 kHz
VB 10.0 kHz
ST 60.00 msec


08:49:38 NOV 29, 1999 RE02 SARR & SARP PLOT 2
RL -40.00 dBm Ant. Vertical
MKR #1 FRQ 119.063 MHz
-110.57 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
119.063 MHz
-110.57 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
JE 26151/5E
Par 3.4.6
7A
269
-100 dBm
START 118.000 MHz
STOP 120.000 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 6.000 sec

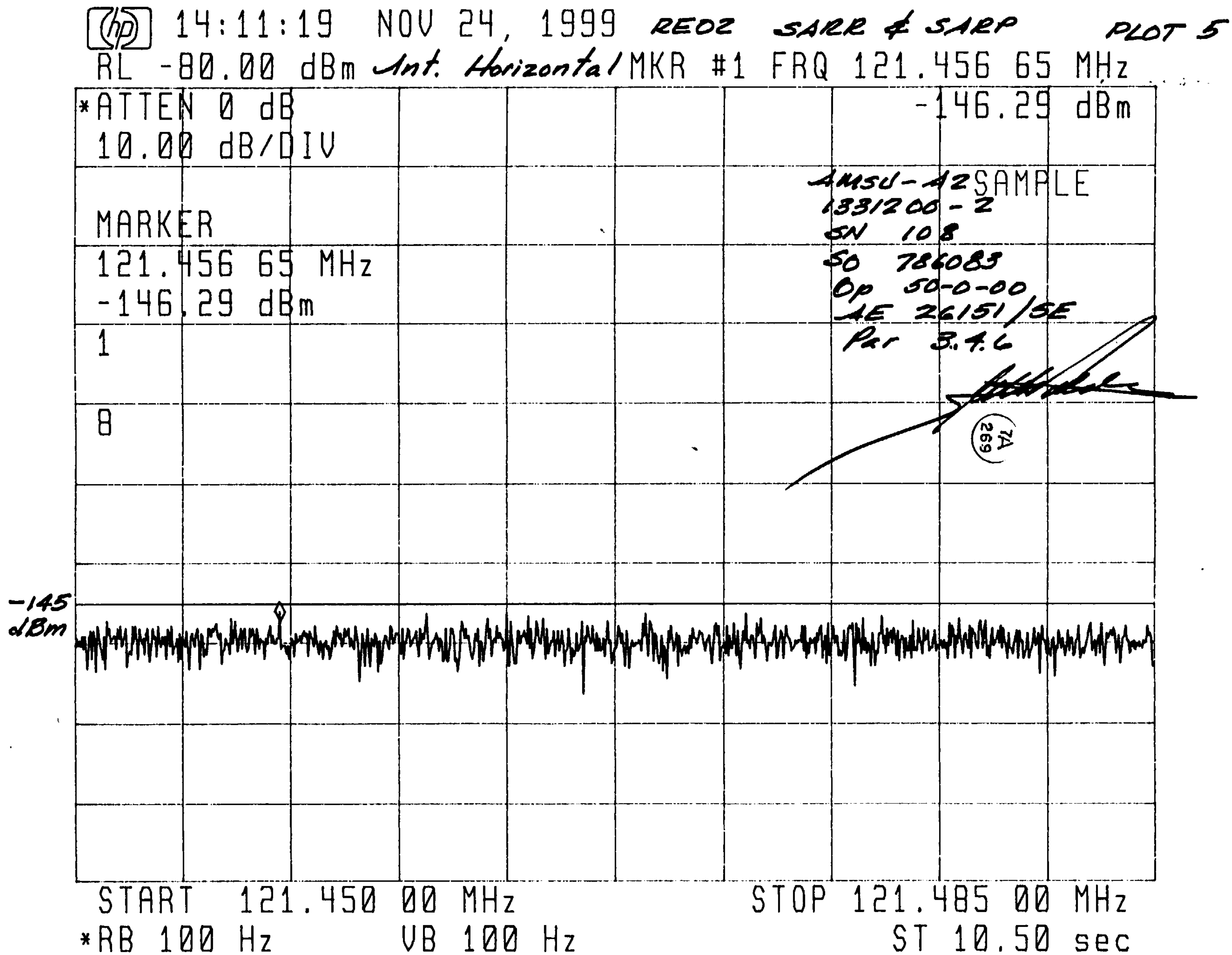


13:37:17 NOV 24, 1999 RE02 SARR & SARP
PLOT 3
RL -80.00 dBm Int. Horizontal
MKR #1 FRQ 120.723 MHz
-136.03 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
120.723 MHz
-136.03 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
7A
269
-125 dBm
START 120.000 MHz
*RB 1.00 kHz
VB 1.00 kHz
STOP 121.450 MHz
ST 4.350 sec

PLOT 4

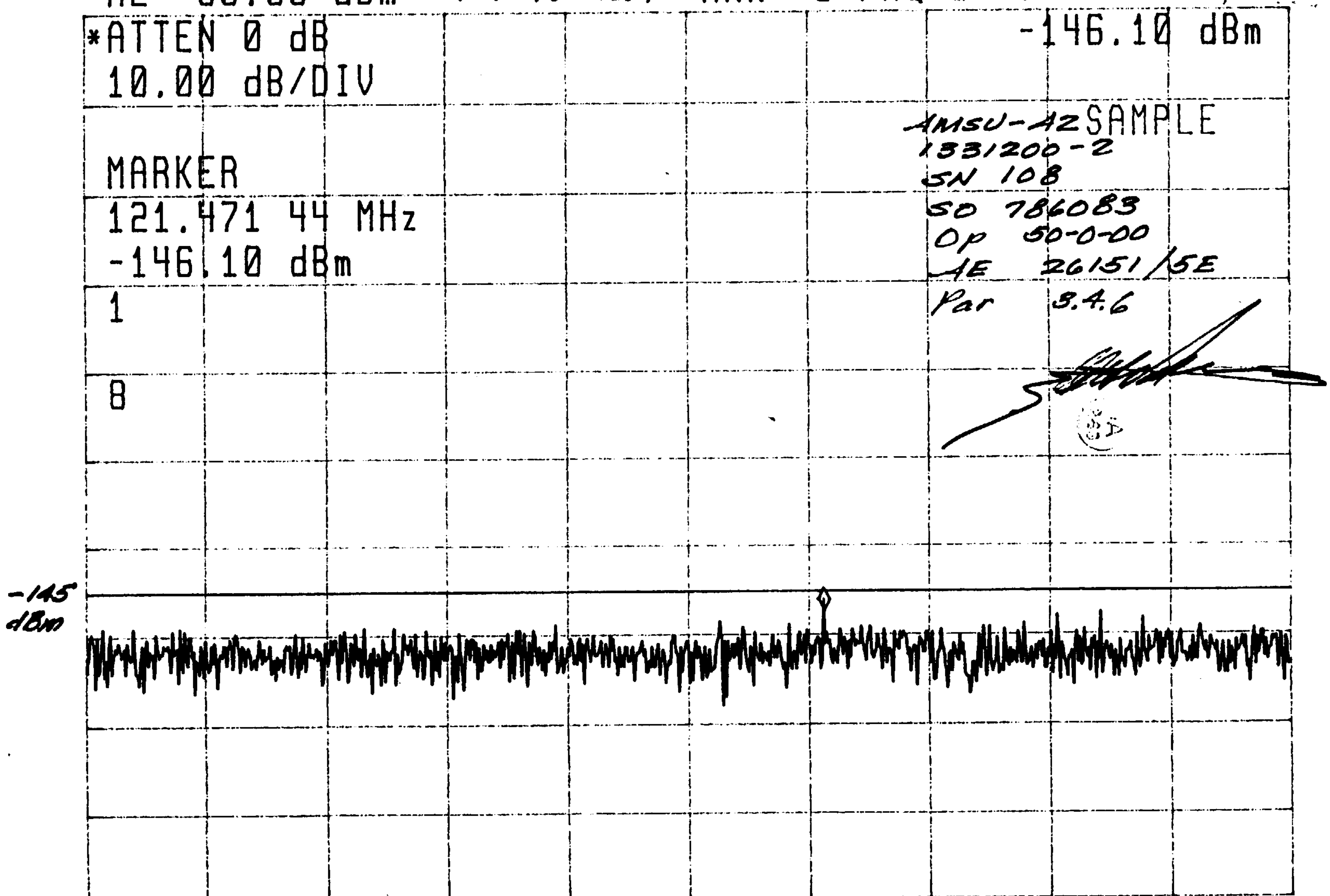


08:47:09 NOV 29, 1999 RE02 SARR & SARP
RL -80.00 dBm Ant. Vertical MKR #1 FRQ 120.002 MHz
*ATTEN 0 dB
-130.61 dBm
10.00 dB/DIV
MARKER
120.002 MHz
-130.61 dBm
1
8
-125 dBm
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
QE 26151/SE
Par 3.4.6
7A 269
START 120.000 MHz
STOP 121.450 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 4.350 sec


14:11:19 NOV 24, 1999 REO2 SARR & SARP PLOT 5
RL -80.00 dBm Ant. Horizontal MKR #1 FRQ 121.456 65 MHz
*ATTEN 0 dB
10.00 dB/DIV
-146.29 dBm
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
MARKER
121.456 65 MHz
-146.29 dBm
1
8
7A
269
-145
dBm
START 121.450 00 MHz
STOP 121.485 00 MHz
*RB 100 Hz
VB 100 Hz
ST 10.50 sec

08:44:24 NOV 29, 1999 RE02 SARR & SARP PLOT6

RL -80.00 dBm Ant. Vertical MKR #1 FRQ 121.471 44 MHz

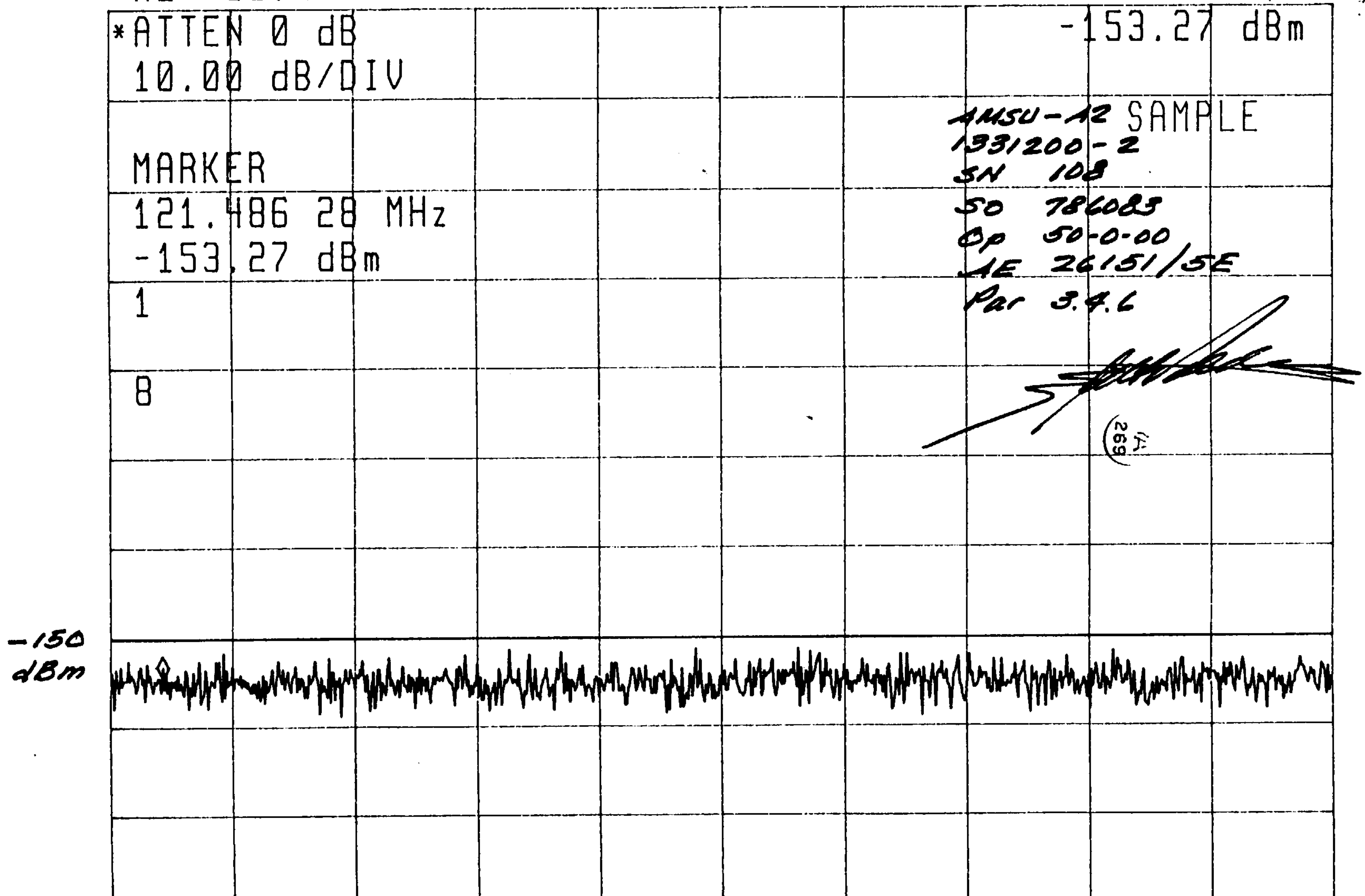


START 121.450 00 MHz STOP 121.485 00 MHz

*RB 30.0 Hz VB 30.0 Hz ST 116.7 sec

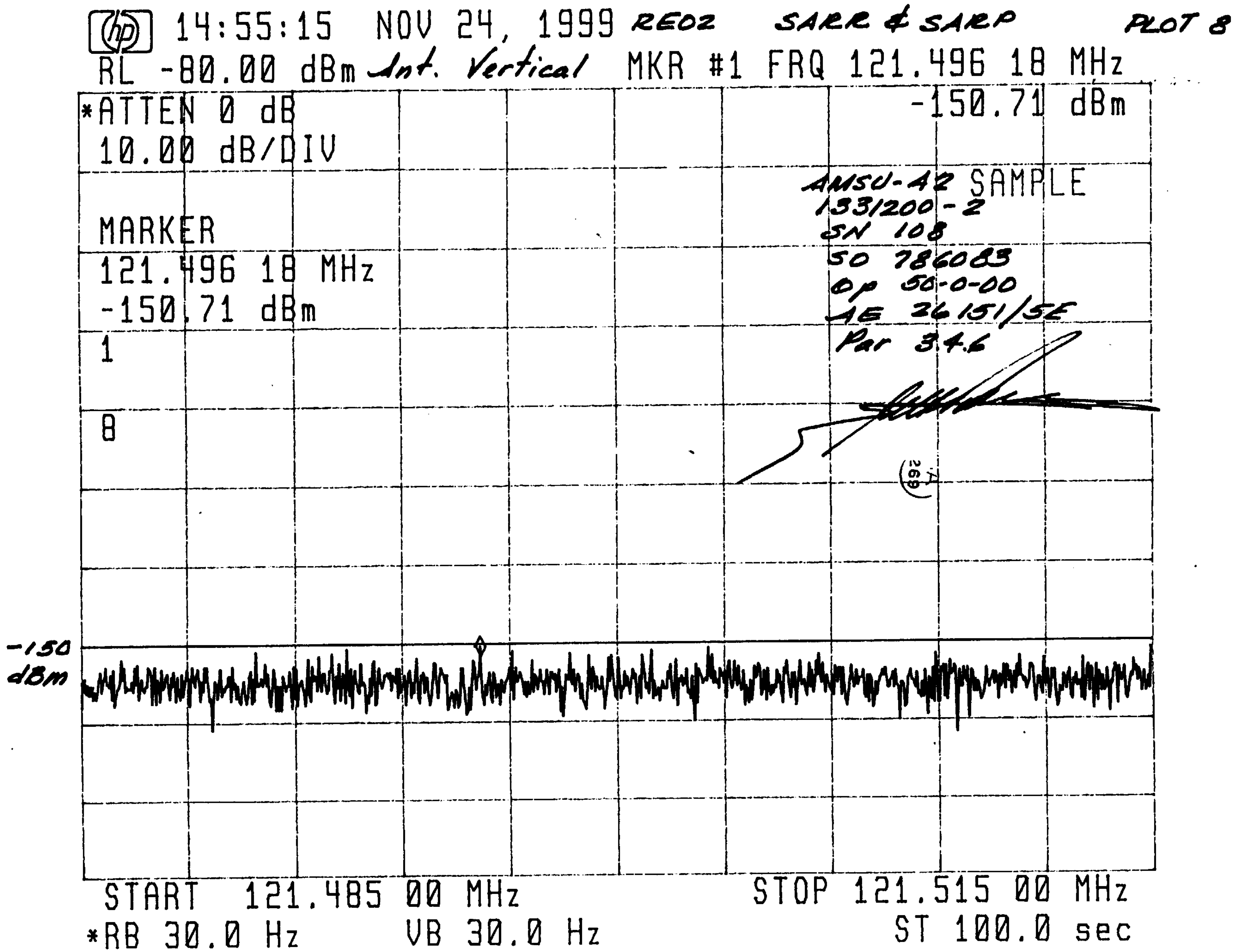
14:08:39 NOV 24, 1999 REO2 SARR & SARP PLOT 7

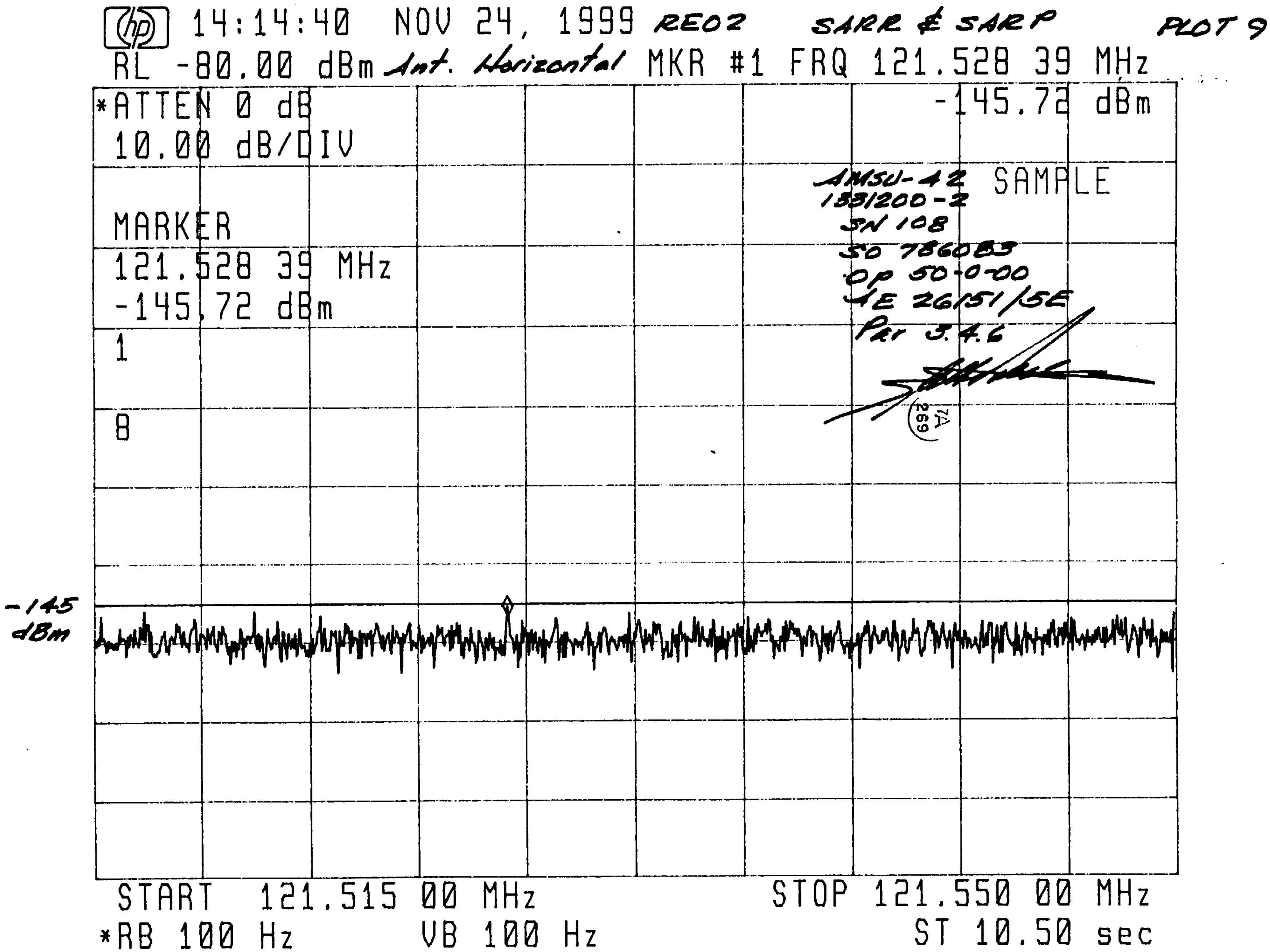
RL -80.00 dBm Ant. Horizontal MKR #1 FRQ 121.486 28 MHz



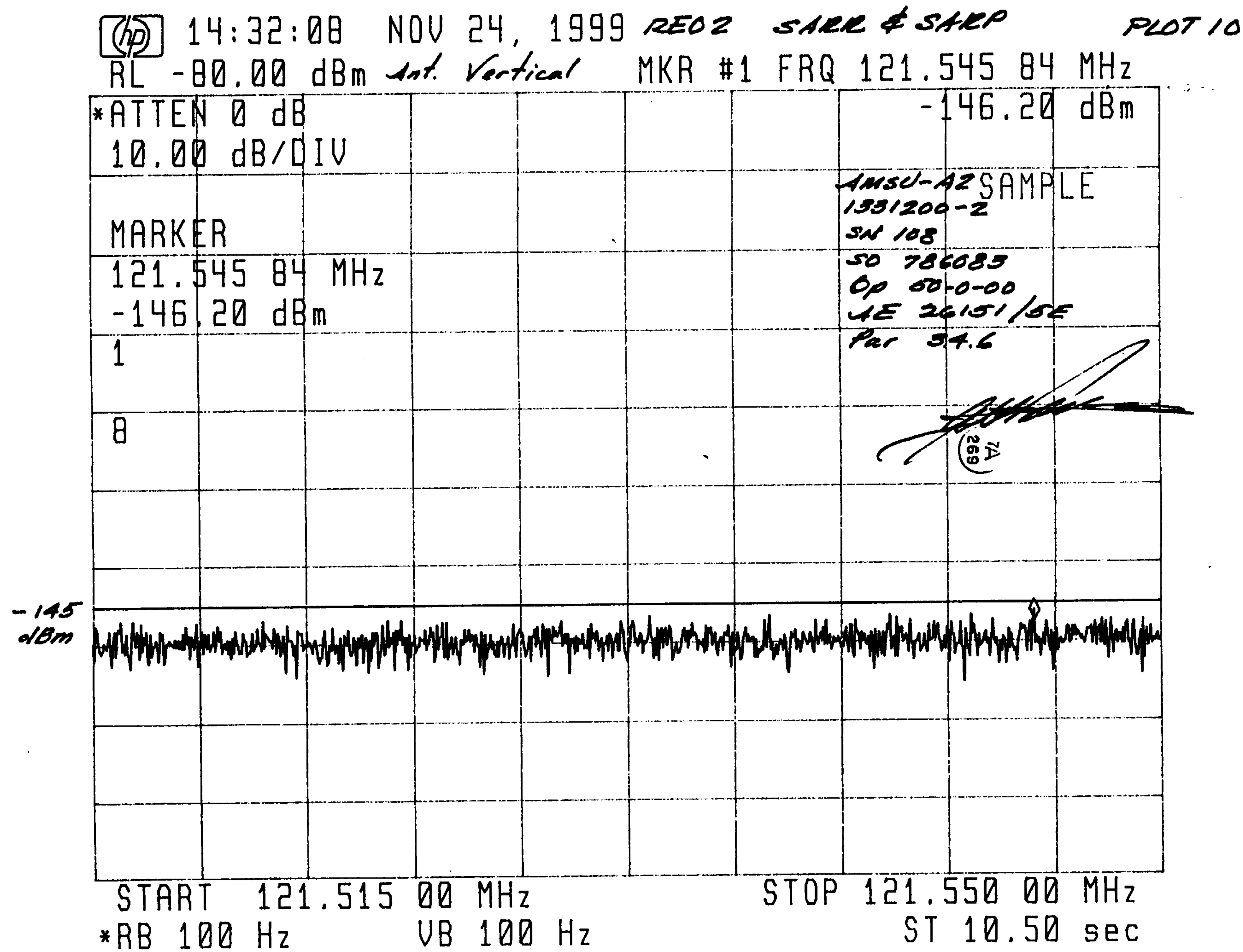
START 121.485 00 MHz STOP 121.515 00 MHz

*RB 30.0 Hz VB 30.0 Hz ST 100.0 sec


14:55:15 NOV 24, 1999 RE02 SARR & SARP PLOT 8
RL -80.00 dBm Int. Vertical MKR #1 FRQ 121.496 18 MHz
-150.71 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
121.496 18 MHz
-150.71 dBm
1
8
AMSU-A2 SAMPLE
133/200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
269
-150 dBm
START 121.485 00 MHz
*RB 30.0 Hz
VB 30.0 Hz
STOP 121.515 00 MHz
ST 100.0 sec



14:14:40 NOV 24, 1999 RE02 SARR & SARP PLOT 9
RL -80.00 dBm Ant. Horizontal MKR #1 FRQ 121.528 39 MHz
-145.72 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
121.528 39 MHz
-145.72 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
OP 50-0-00
IE 26151/SE
Par 3.4.6
7A
269
-145
dBm
START 121.515 00 MHz
STOP 121.550 00 MHz
*RB 100 Hz
VB 100 Hz
ST 10.50 sec

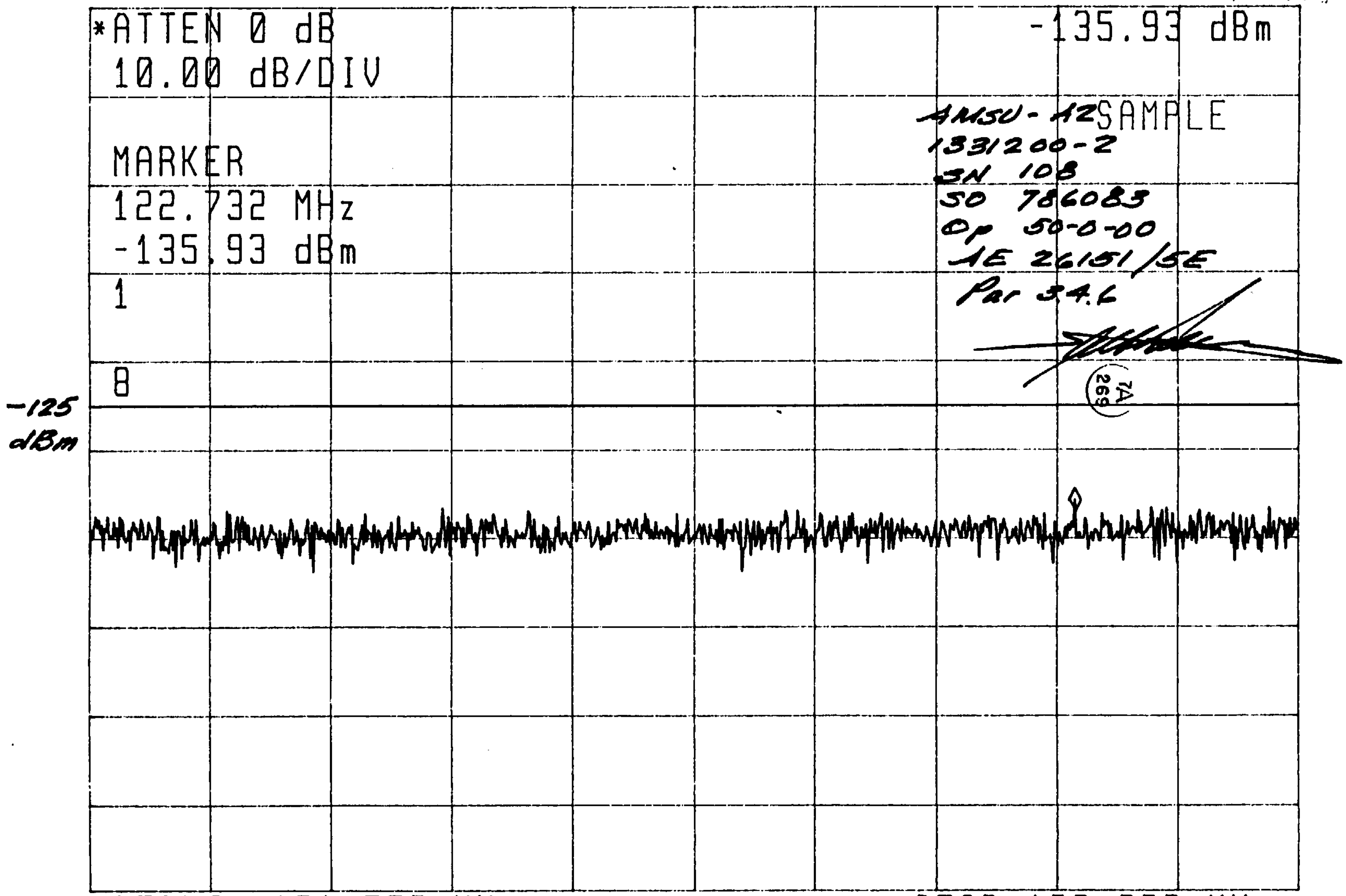


14:32:08 NOV 24, 1999 RE02 SARR & SARP
PLOT 10
RL -80.00 dBm Ant. Vertical
MKR #1 FRQ 121.545 84 MHz
-146.20 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
121.545 84 MHz
-146.20 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 00-0-00
AE 26151/5E
Par 34.6
7A
269
-145
dBm
START 121.515 00 MHz
*RB 100 Hz
VB 100 Hz
STOP 121.550 00 MHz
ST 10.50 sec

PLOT 11

14:17:19 NOV 24, 1999 RE02 SARR & SARP

RL -80.00 dBm Ant. Horizontal MKR #1 FRQ 122.732 MHz



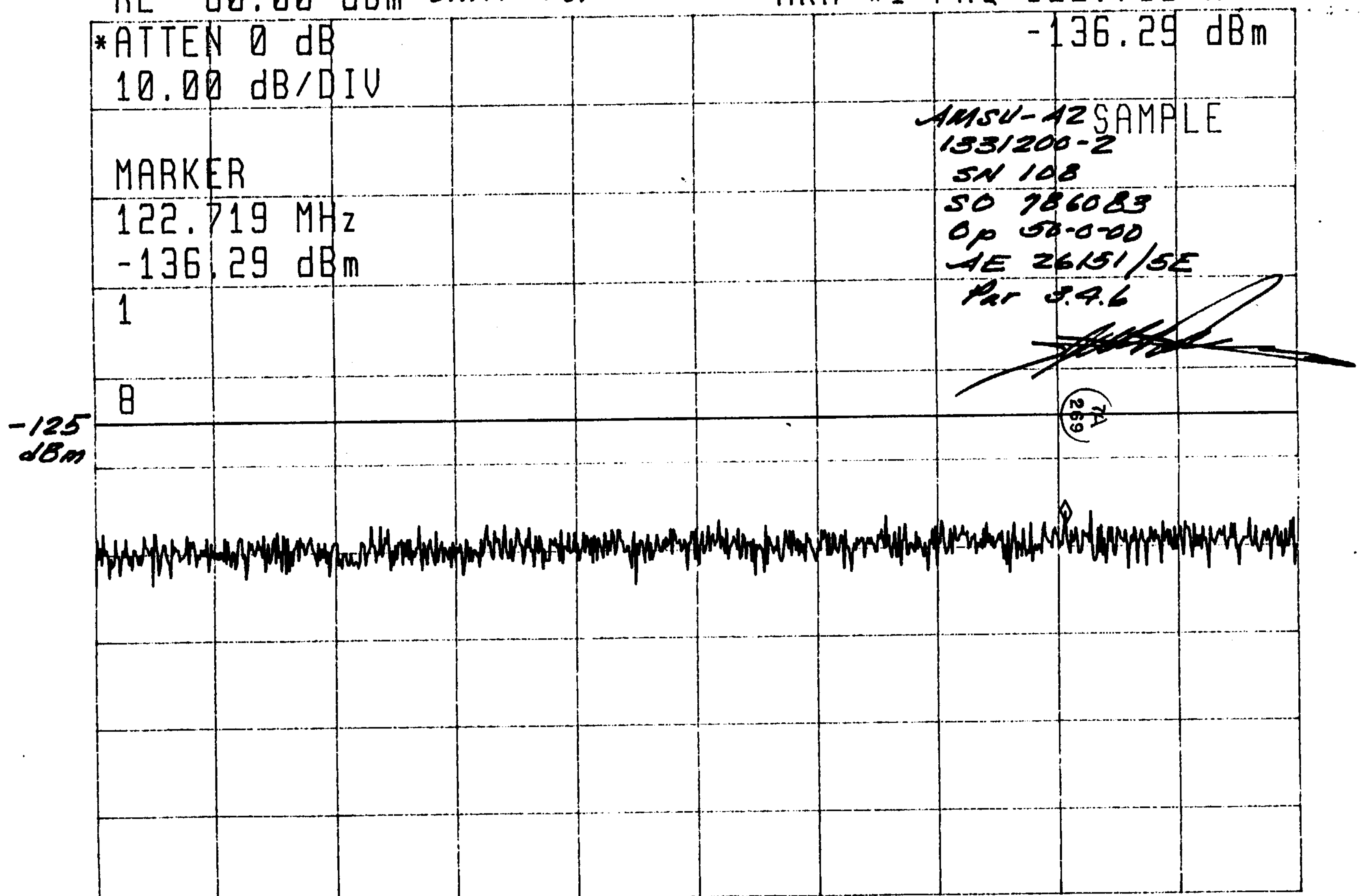
START 121.550 MHz STOP 123.000 MHz

*RB 1.00 kHz VB 1.00 kHz ST 4.350 sec

14:28:58 NOV 24, 1999 REO2 SARR & SARP PLOT 12

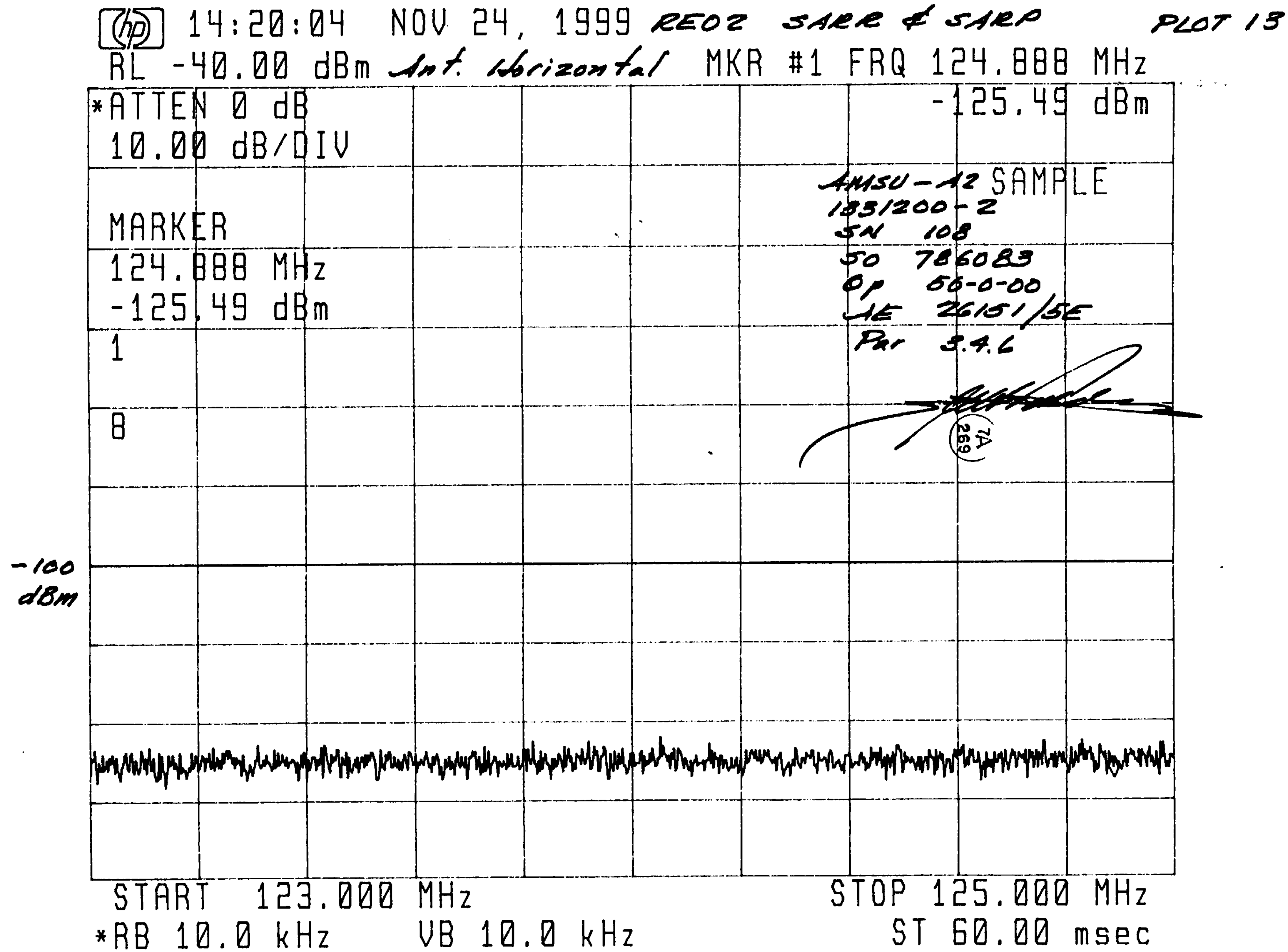
RL -80.00 dBm Ant. Vertical MKR #1 FRQ 122.719 MHz

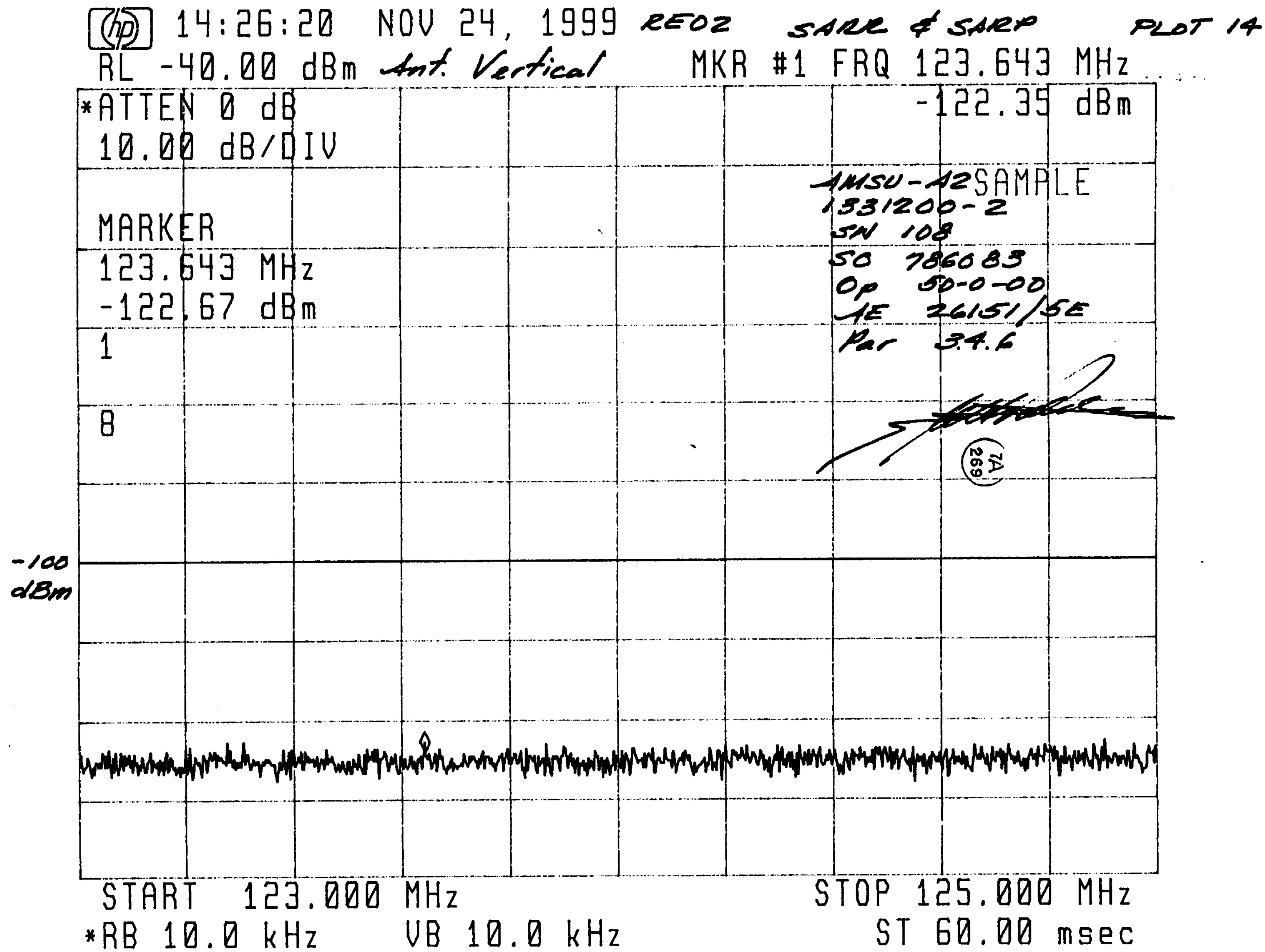
-136.29 dBm

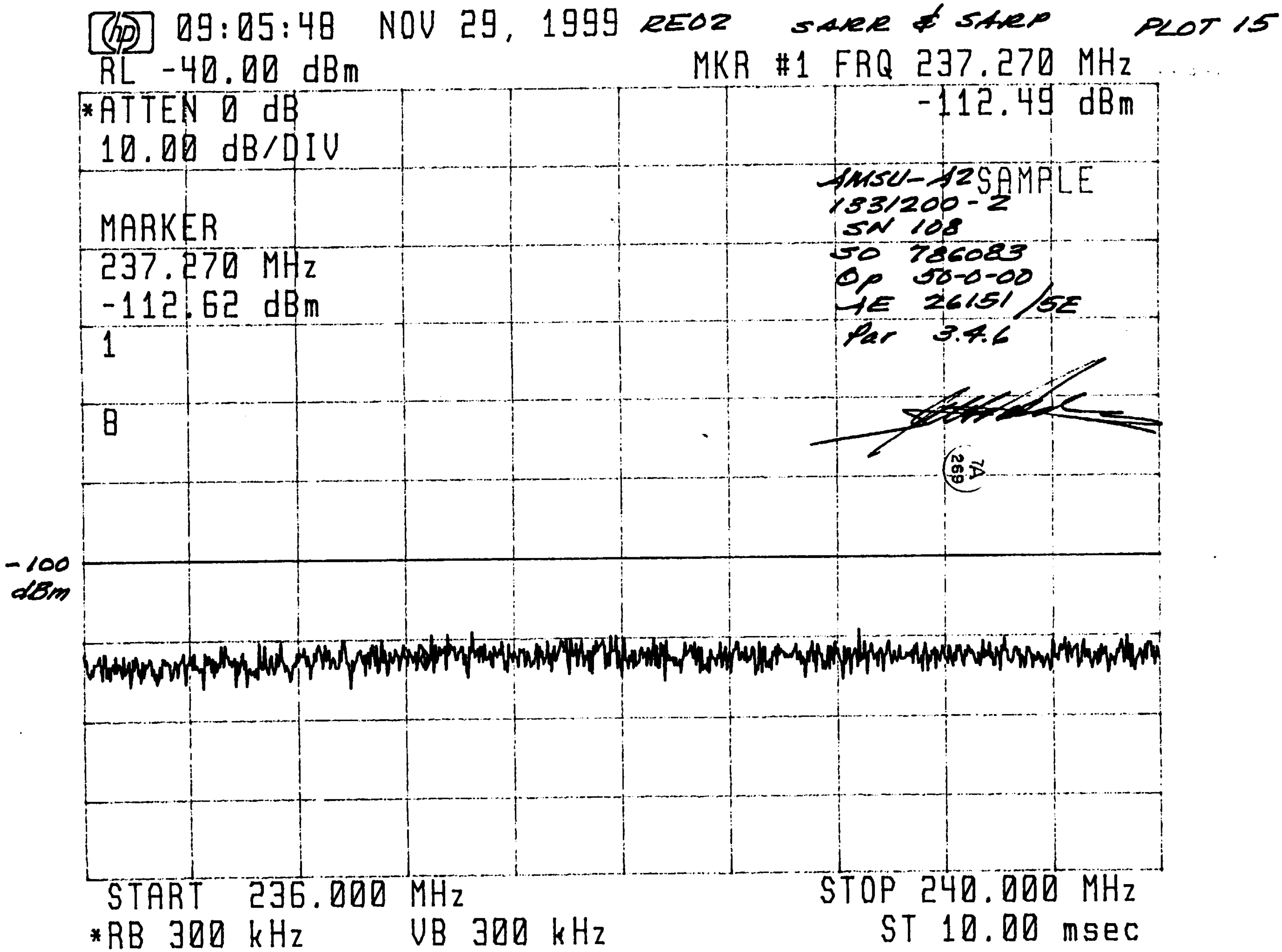


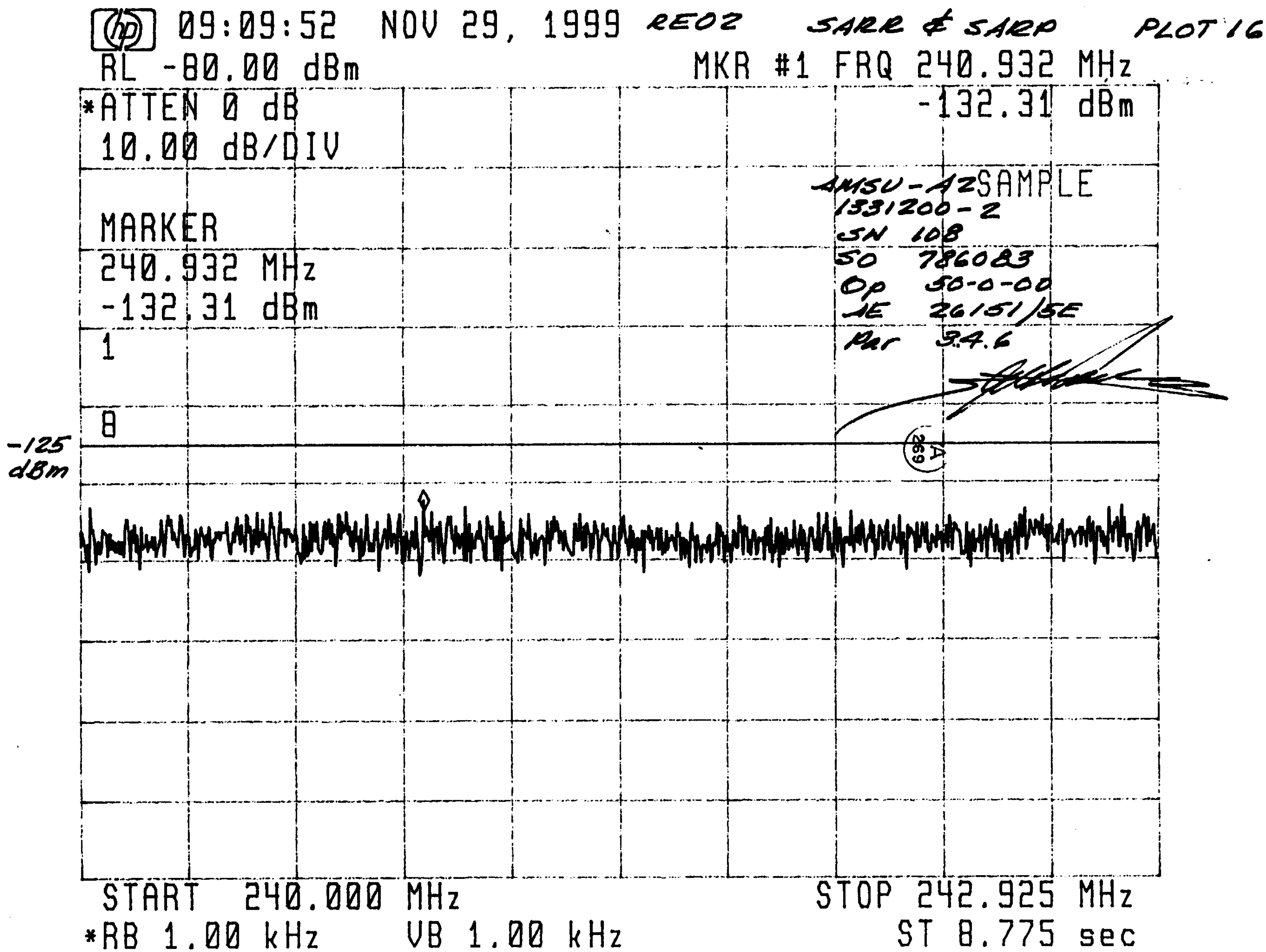
START 121.550 MHz STOP 123.000 MHz

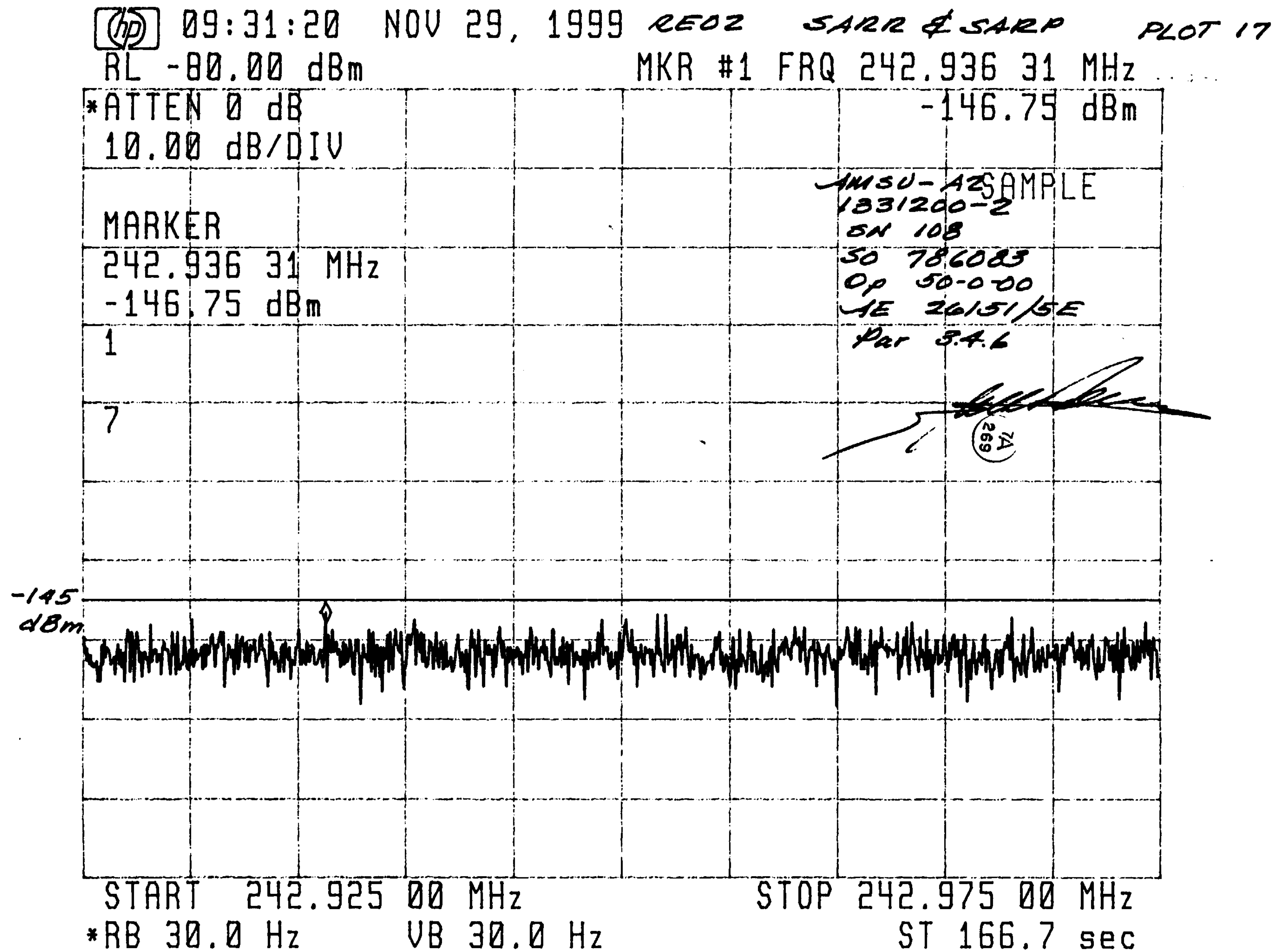
*RB 1.00 kHz VB 1.00 kHz ST 4.350 sec

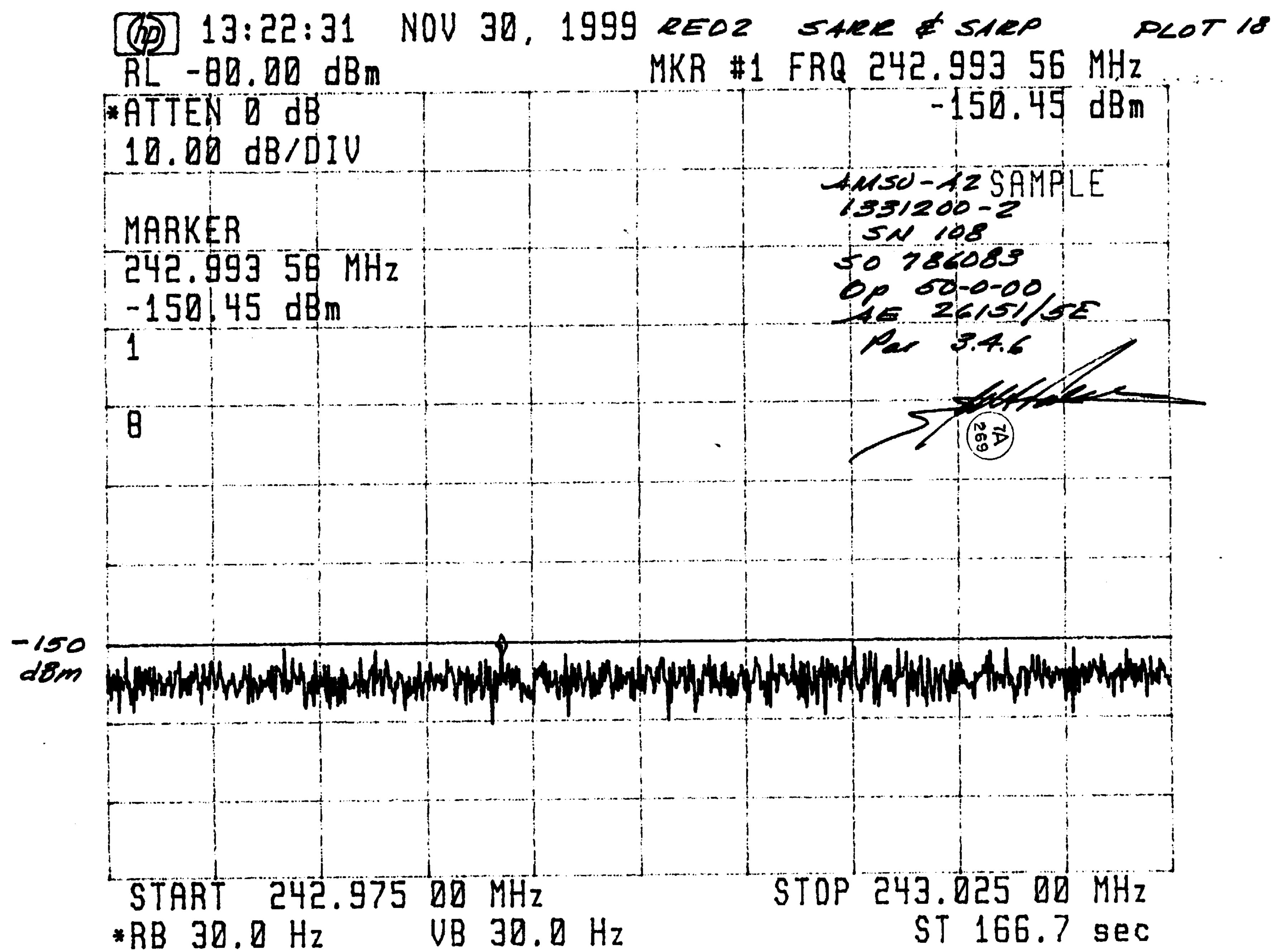

14:20:04 NOV 24, 1999 REO2 SARR & SARP
PLOT 13
RL -40.00 dBm Ant. Horizontal
MKR #1 FRQ 124.888 MHz
-125.49 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
124.888 MHz
-125.49 dBm
1
8
AMSU-A2 SAMPLE
183/200-2
SN 108
SO 786083
OP 56-0-00
JE 26151/5E
Par 3.4.6
7A
269
-100
dBm
START 123.000 MHz
STOP 125.000 MHz
*RB 10.0 kHz
VB 10.0 kHz
ST 60.00 msec

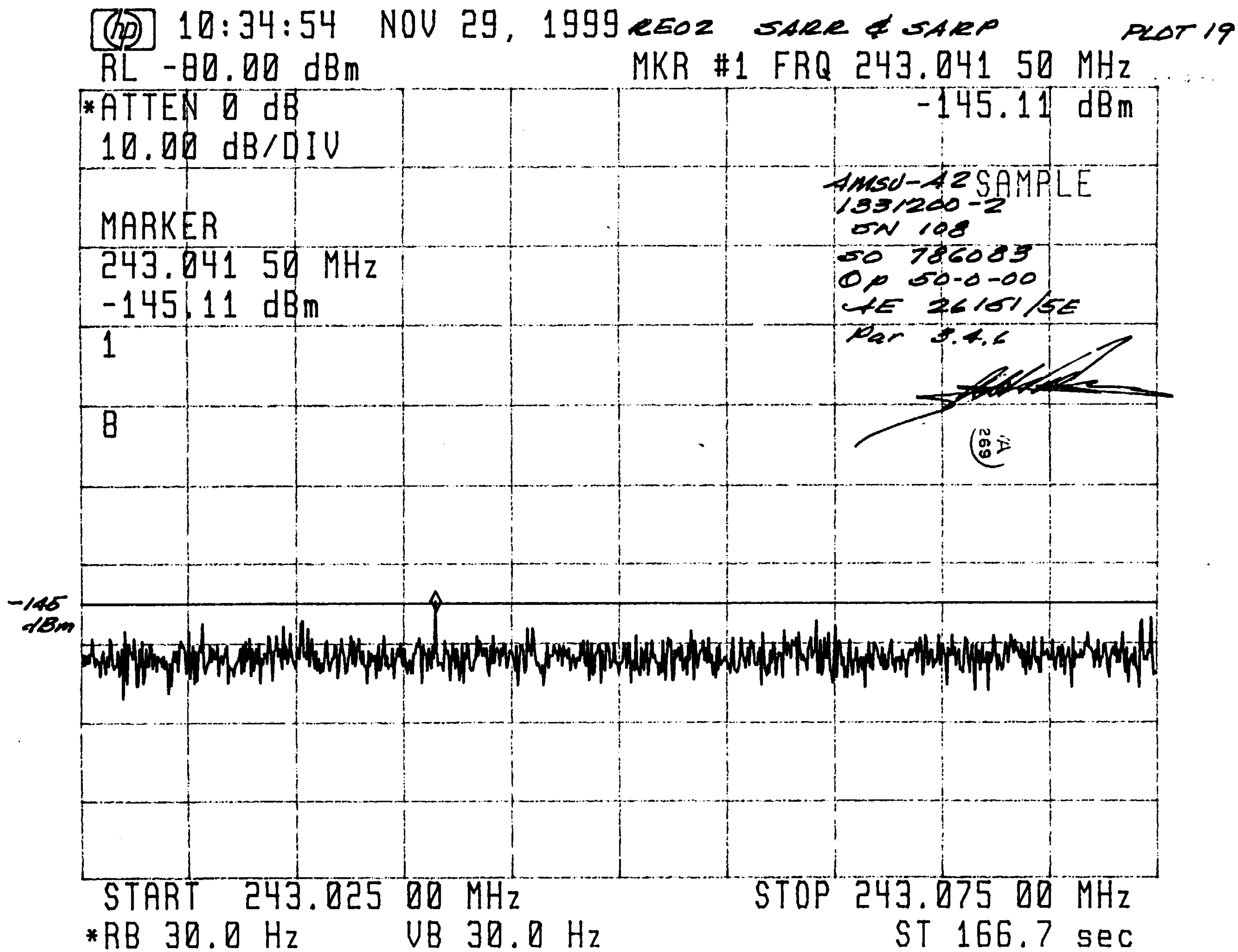

14:26:20 NOV 24, 1999 RE02 SARR & SARP PLOT 14
RL -40.00 dBm Ant. Vertical
MKR #1 FRQ 123.643 MHz
-122.35 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
123.643 MHz
-122.67 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
-100 dBm
START 123.000 MHz
STOP 125.000 MHz
*RB 10.0 kHz
VB 10.0 kHz
ST 60.00 msec

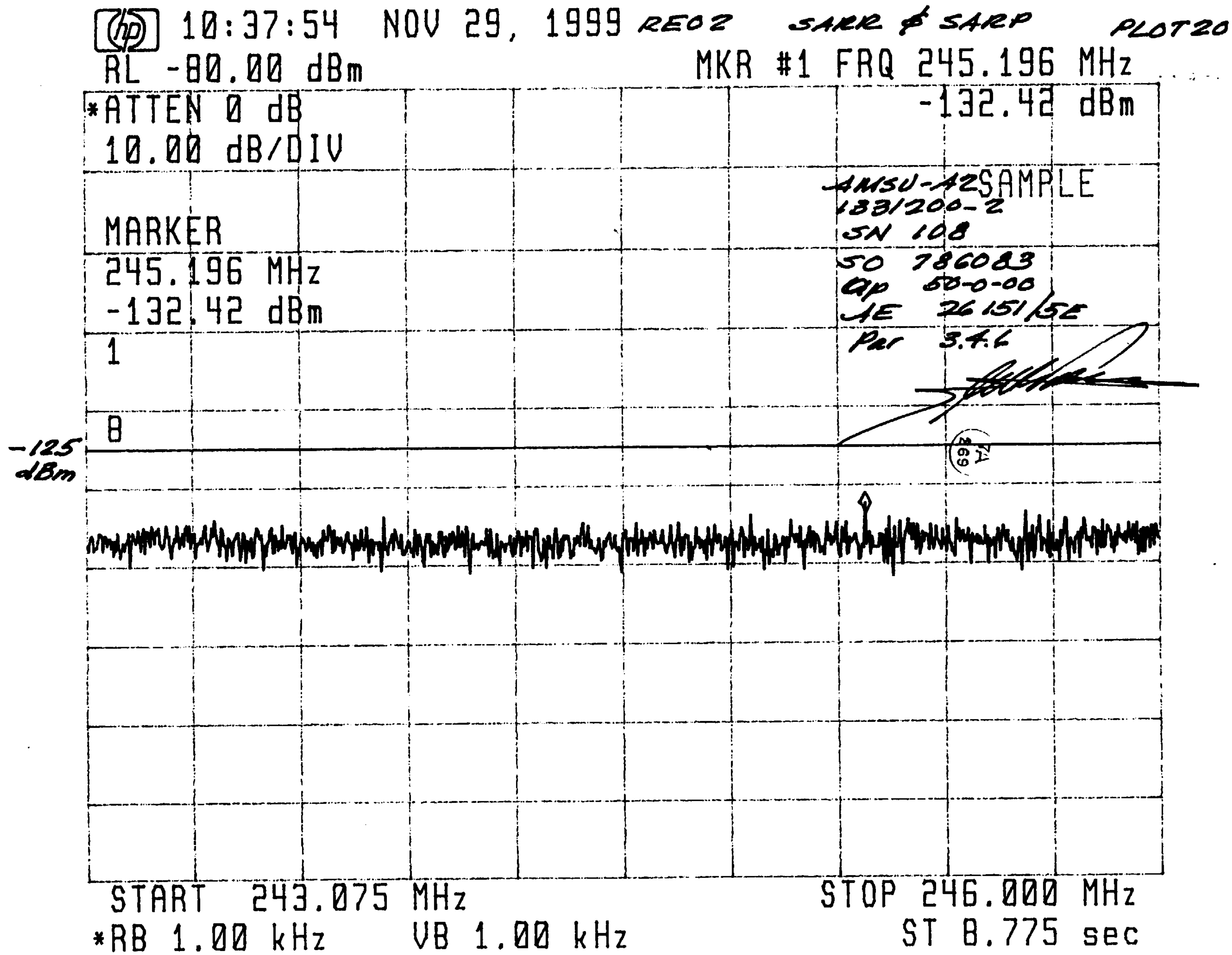

09:05:48 NOV 29, 1999 RE02 SARR & SARP PLOT 15
RL -40.00 dBm
MKR #1 FRQ 237.270 MHz
-112.49 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
237.270 MHz
-112.62 dBm
1
8
AMSU-A2 SAMPLE
133/200-2
SN 108
SO 786083
Op 50-0-00
TE 26151/SE
Par 3.4.6
7A
269
-100 dBm
START 236.000 MHz
*RB 300 kHz
VB 300 kHz
STOP 240.000 MHz
ST 10.00 msec

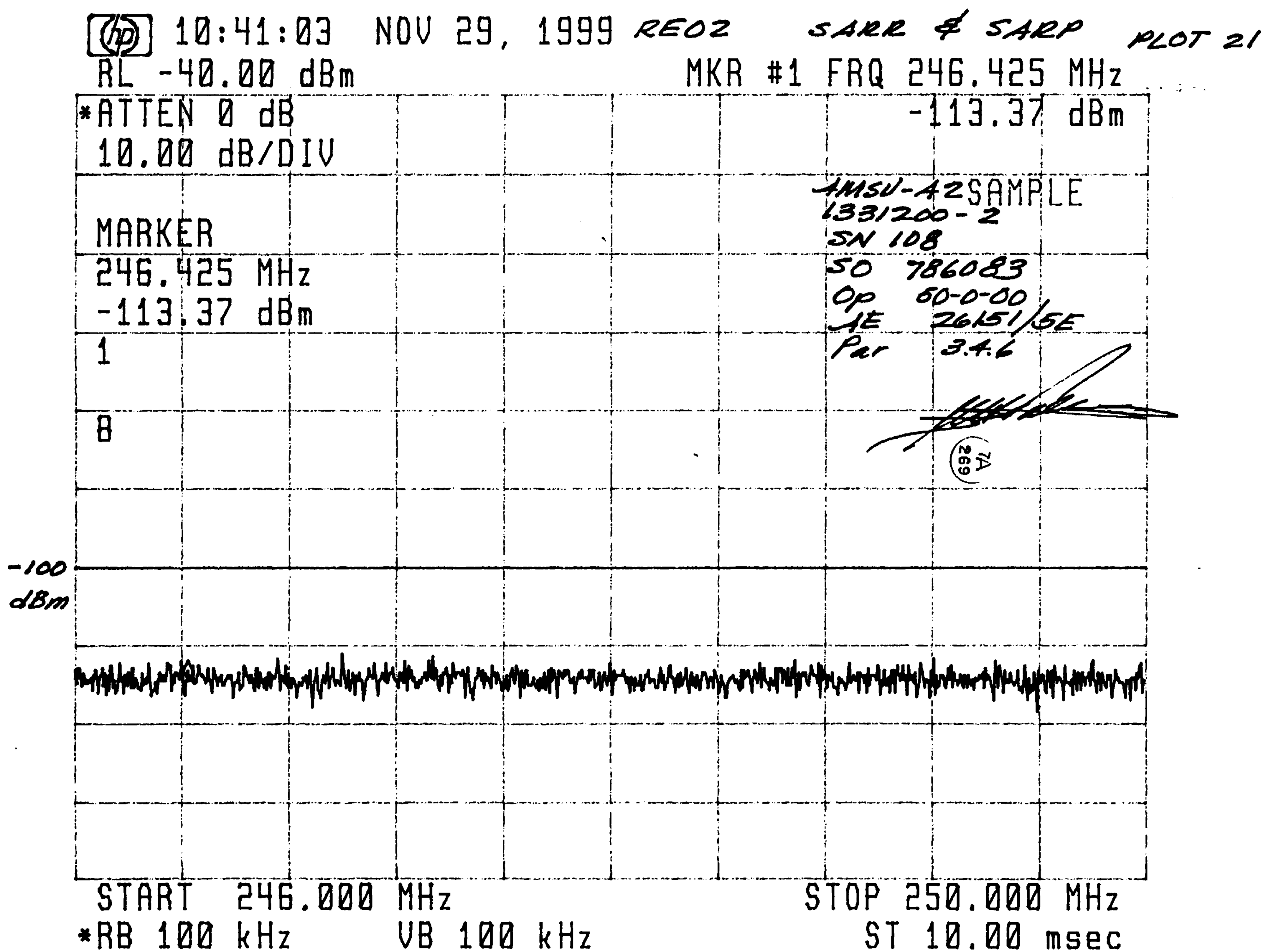

09:09:52 NOV 29, 1999
RE02
SARR & SARP
PLOT 16
RL -80.00 dBm
MKR #1 FRQ 240.932 MHz
-132.31 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
240.932 MHz
-132.31 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
JE 26151/5E
Par 3.4.6
-125 dBm
START 240.000 MHz
STOP 242.925 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 8.775 sec

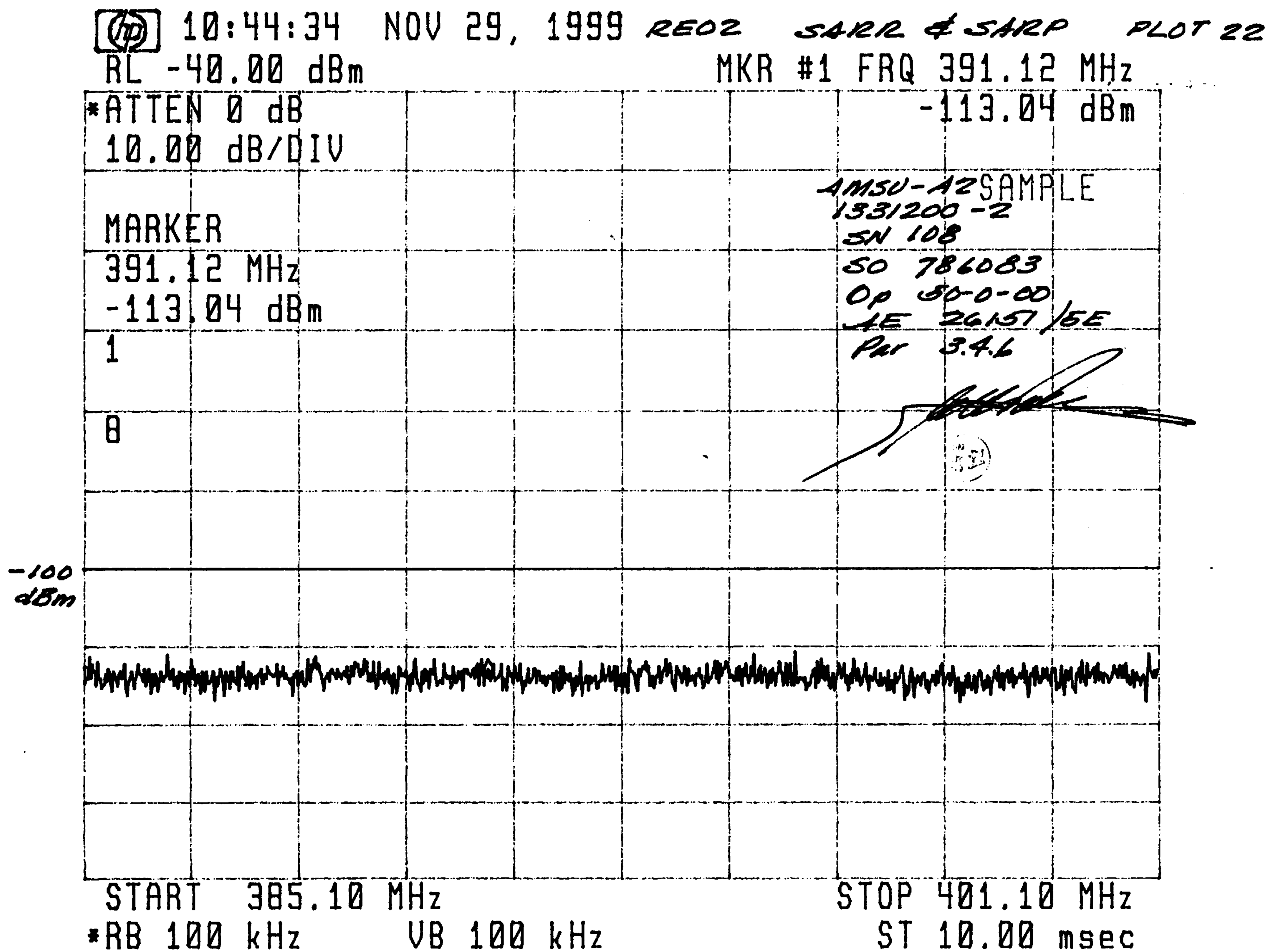

09:31:20 NOV 29, 1999 REOZ SARR & SARP PLOT 17
RL -80.00 dBm
MKR #1 FRQ 242.936 31 MHz
*ATTEN 0 dB
-146.75 dBm
10.00 dB/DIV
SAMPLE
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
MARKER
242.936 31 MHz
-146.75 dBm
1
7
7A
269
-145 dBm
START 242.925 00 MHz
STOP 242.975 00 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 166.7 sec


13:22:31 NOV 30, 1999 REO2 SARR & SARP PLOT 18
RL -80.00 dBm
MKR #1 FRQ 242.993 56 MHz
-150.45 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
242.993 56 MHz
-150.45 dBm
1
B
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
7A
269
-150
dBm
START 242.975 00 MHz
STOP 243.025 00 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 166.7 sec

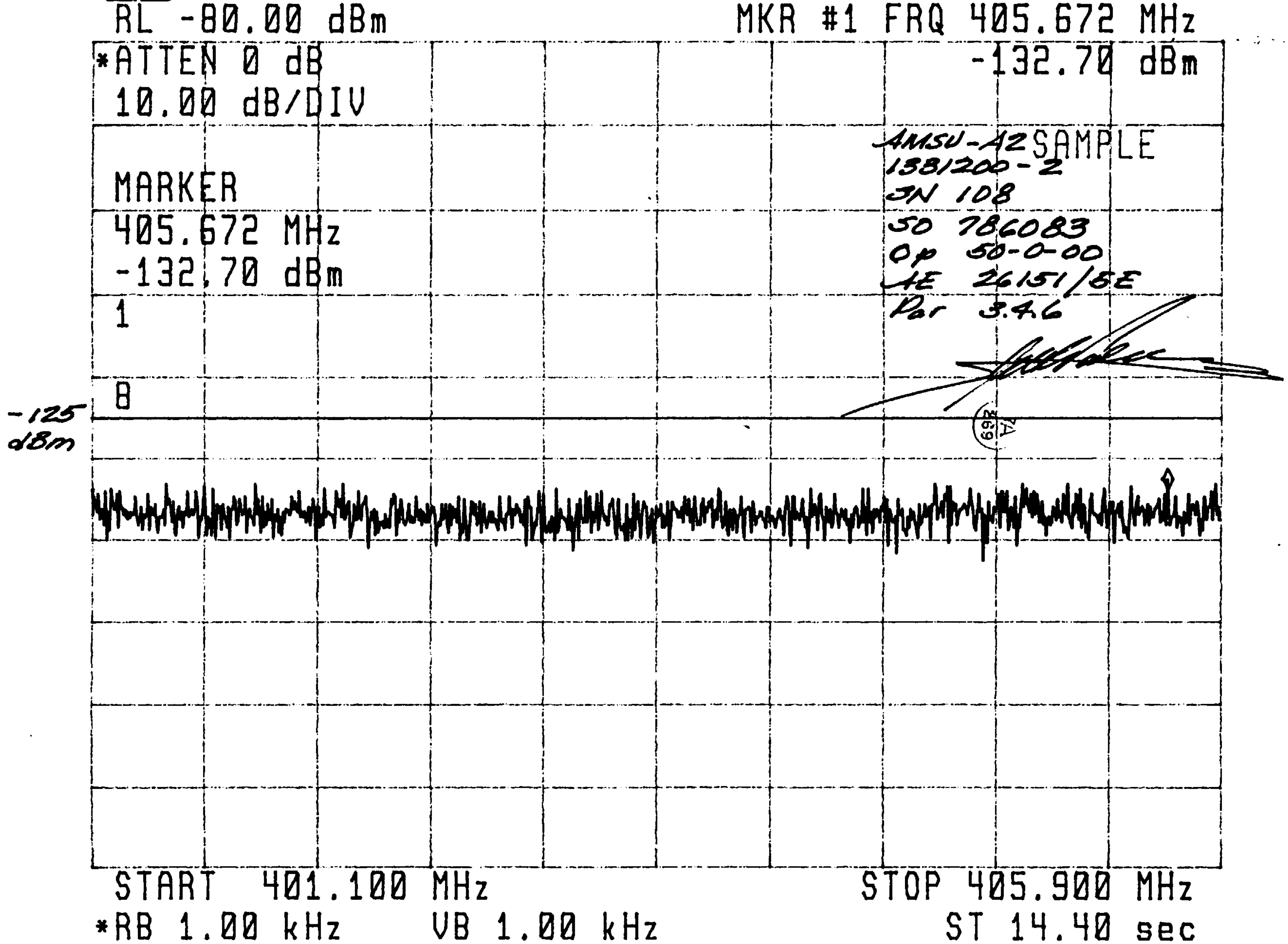

10:34:54 NOV 29, 1999 RE02 SARR & SARP
PLOT 19
RL -80.00 dBm
MKR #1 FRQ 243.041 50 MHz
*ATTEN 0 dB
-145.11 dBm
10.00 dB/DIV
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26161/SE
Par 3.4.6
MARKER
243.041 50 MHz
-145.11 dBm
1
B
-145 dBm
START 243.025 00 MHz
STOP 243.075 00 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 166.7 sec

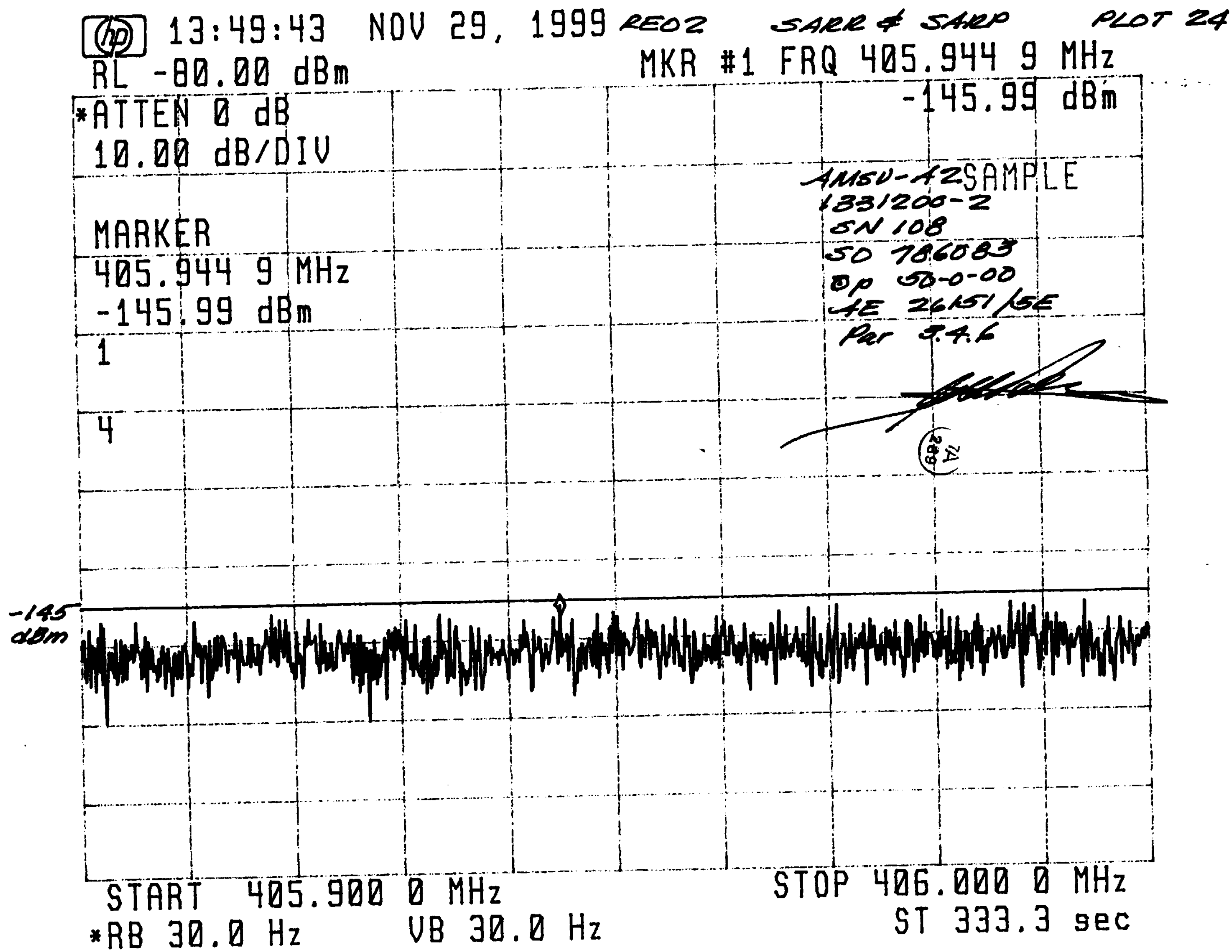

10:37:54 NOV 29, 1999 RE02 SARR & SARP PLOT20
RL -80.00 dBm
MKR #1 FRQ 245.196 MHz
-132.42 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
245.196 MHz
-132.42 dBm
1
B
AMSU-A2
SAMPLE
183/200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
-125 dBm
START 243.075 MHz
STOP 246.000 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 8.775 sec


10:41:03 NOV 29, 1999 RE02
SARR & SARP
PLOT 21
RL -40.00 dBm
MKR #1 FRQ 246.425 MHz
*ATTEN 0 dB
-113.37 dBm
10.00 dB/DIV
MARKER
246.425 MHz
-113.37 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 60-0-00
AE 26151/5E
Par 3.4.6
7A
269
-100
dBm
START 246.000 MHz
STOP 250.000 MHz
*RB 100 kHz
VB 100 kHz
ST 10.00 msec


10:44:34 NOV 29, 1999 RE02 SARR & SARP PLOT 22
RL -40.00 dBm
MKR #1 FRQ 391.12 MHz
-113.04 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
391.12 MHz
-113.04 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26157/SE
Par 3.4.6
-100 dBm
START 385.10 MHz
STOP 401.10 MHz
*RB 100 kHz
VB 100 kHz
ST 10.00 msec

10:47:19 NOV 29, 1999 *REO2* *SARR & SARP* *PLOT 23*

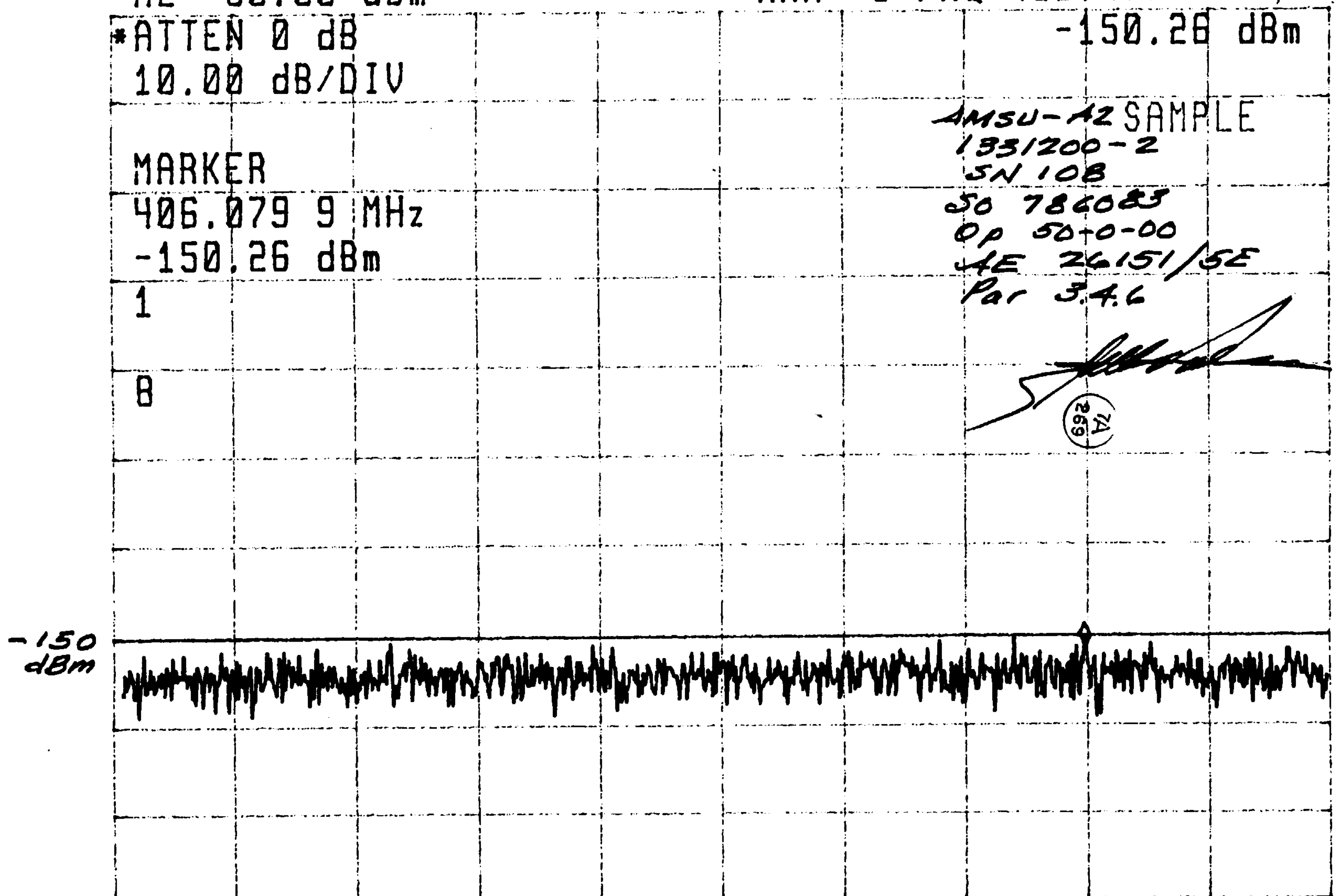




13:49:43 NOV 29, 1999 REO2
SARR & SARP
PLOT 24
MKR #1 FRQ 405.944 9 MHz
-145.99 dBm
RL -80.00 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
405.944 9 MHz
-145.99 dBm
1
4
AMSU-A2
SAMPLE
1331200-2
SN 108
SO 786083
OP 50-0-00
AE 26151/SE
Par 3.4.6
7A
289
-145 dBm
START 405.900 0 MHz
STOP 406.000 0 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 333.3 sec

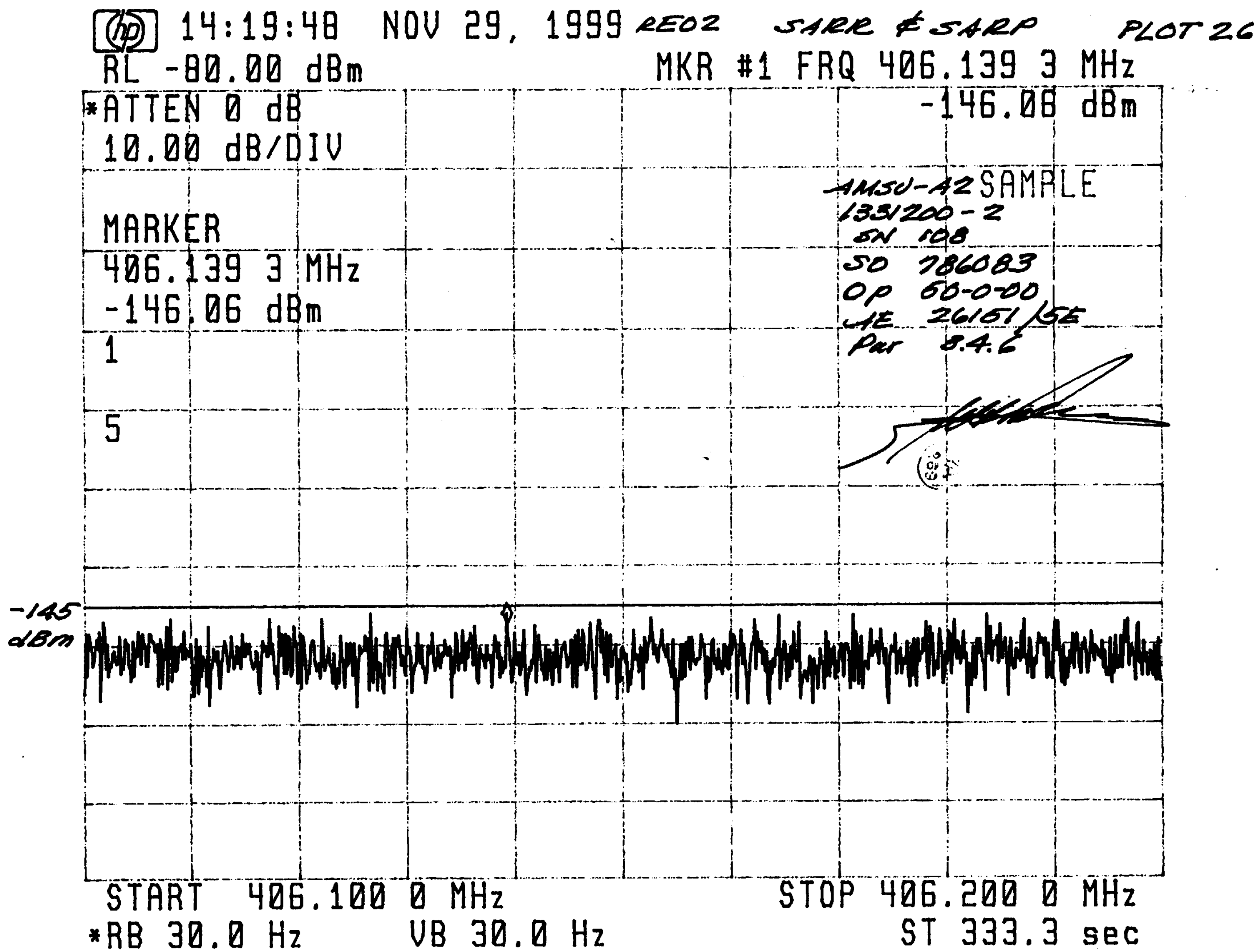
14:13:32 NOV 30, 1999 RE02 SARR & SARP PLOT 25

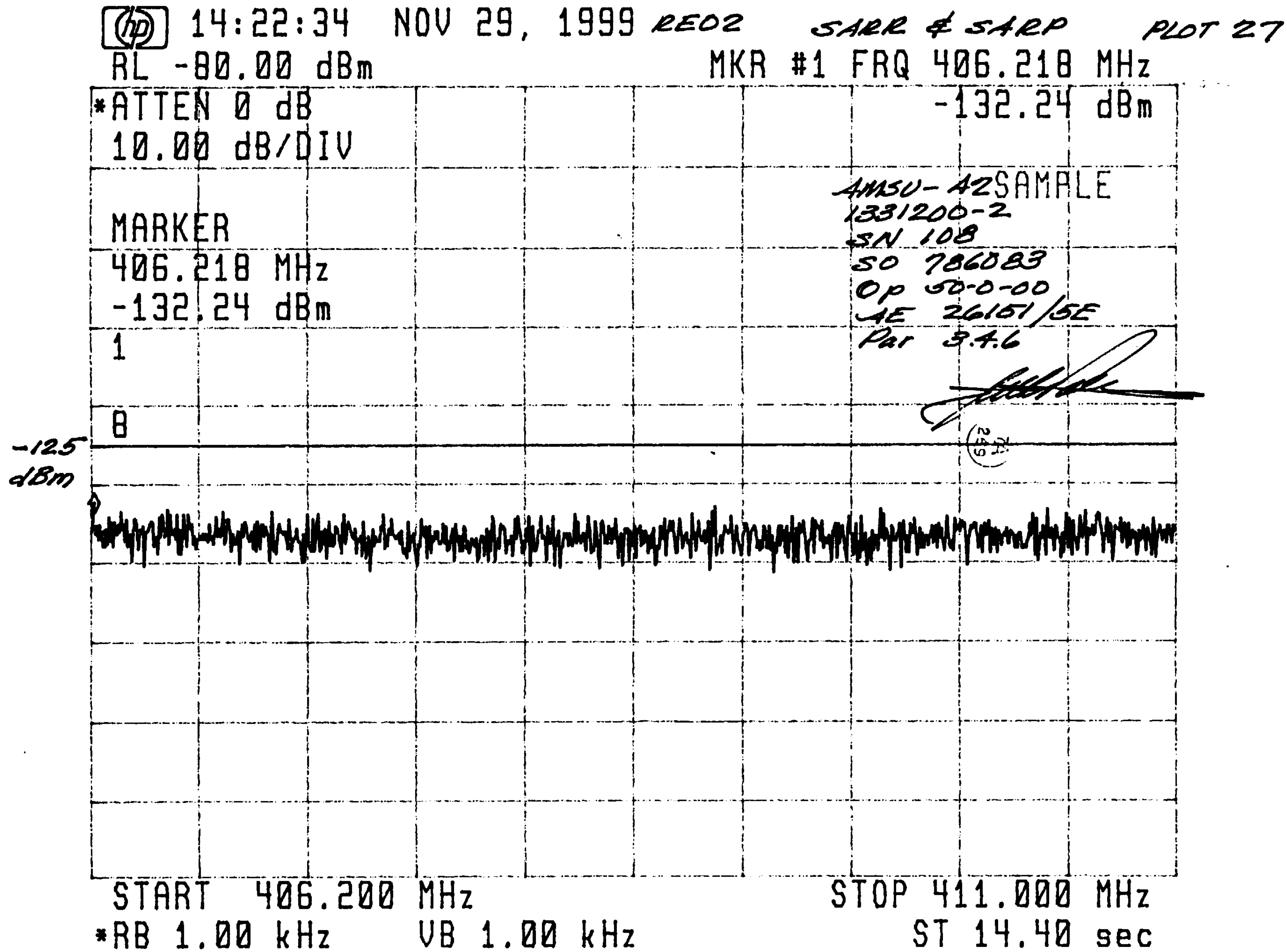
RL -80.00 dBm MKR #1 FRQ 406.079 9 MHz

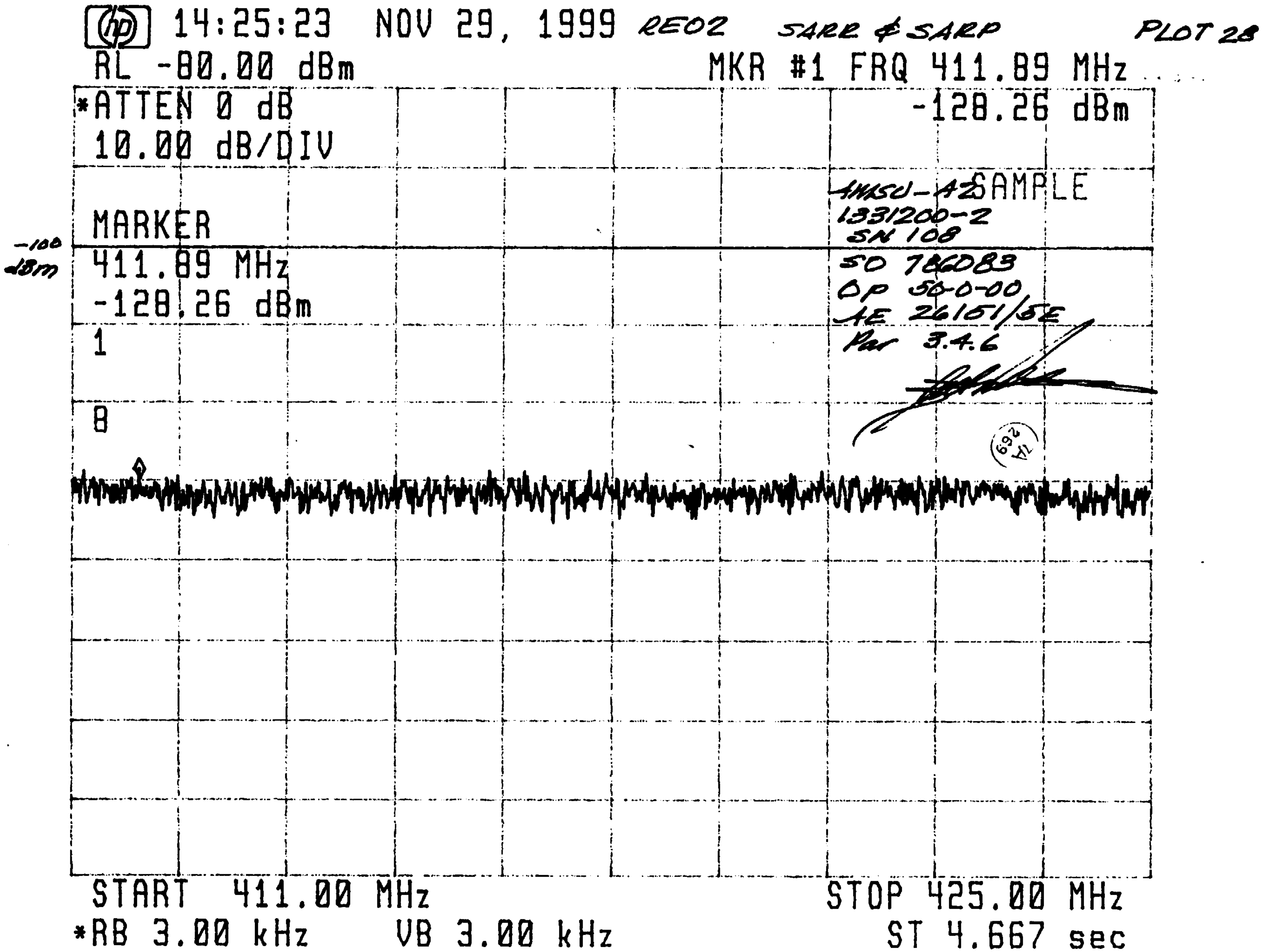


START 406.000 0 MHz STOP 406.100 0 MHz

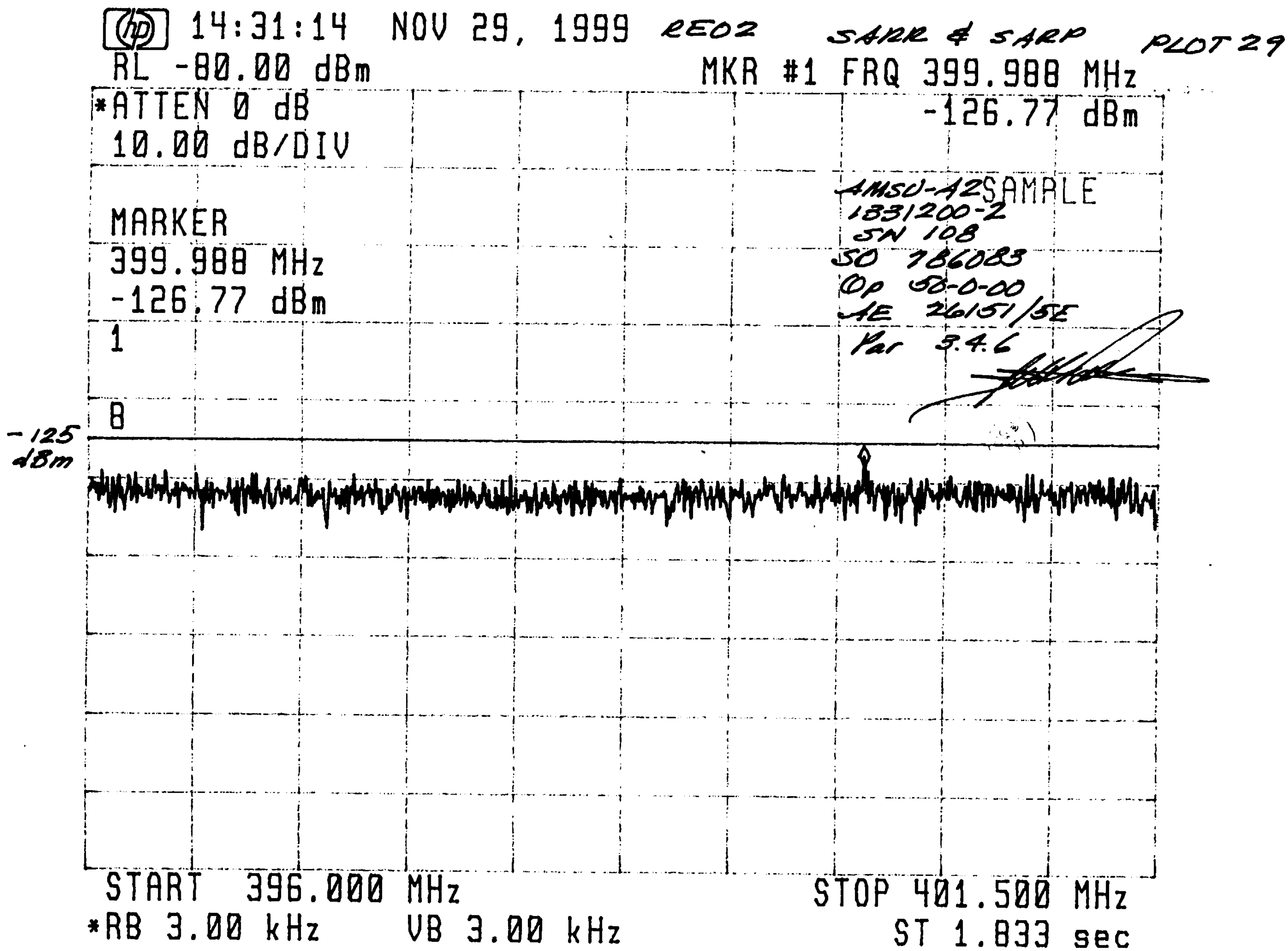
*RB 30.0 Hz VB 30.0 Hz ST 333.3 sec


14:19:48 NOV 29, 1999 RE02 SARR & SARP PLOT 26
RL -80.00 dBm
MKR #1 FRQ 406.139 3 MHz
-146.08 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
406.139 3 MHz
-146.06 dBm
1
5
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
OP 60-0-00
QE 26161 /SE
Par 8.4.6
-145 dBm
START 406.100 0 MHz
STOP 406.200 0 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 333.3 sec


14:22:34 NOV 29, 1999 RE02
SARR & SARP
PLOT 27
RL -80.00 dBm
MKR #1 FRQ 406.218 MHz
-132.24 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
406.218 MHz
-132.24 dBm
1
B
-125 dBm
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
START 406.200 MHz
STOP 411.000 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 14.40 sec

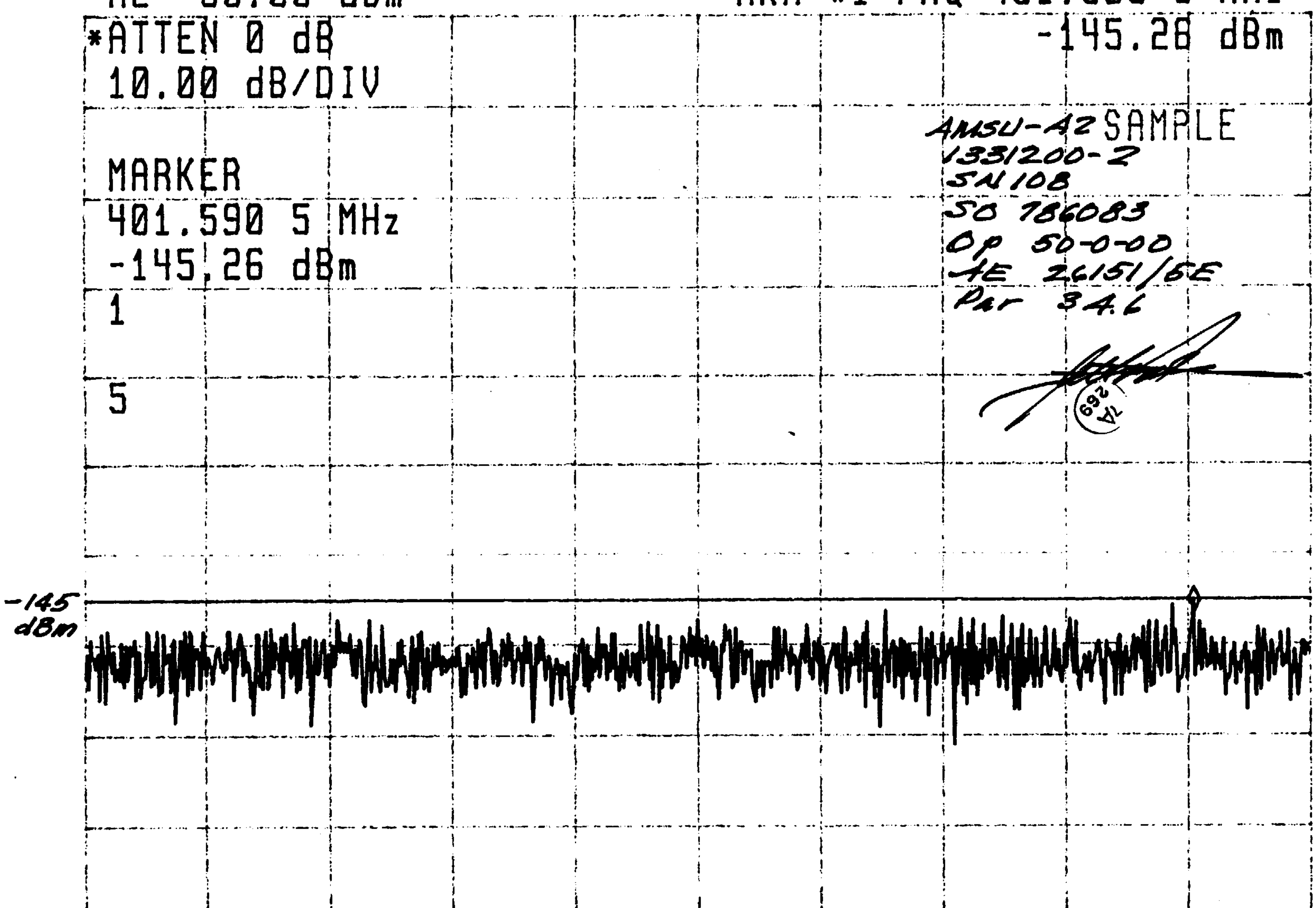


14:25:23 NOV 29, 1999 RE02 SARR & SARP PLOT 28
RL -80.00 dBm
MKR #1 FRQ 411.89 MHz
-128.26 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
411.89 MHz
-128.26 dBm
1
8
-100 dBm
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
OP 50-0-00
AE 26151/5E
Par 3.4.6
7A
269
START 411.00 MHz
STOP 425.00 MHz
*RB 3.00 kHz
VB 3.00 kHz
ST 4.667 sec


14:31:14 NOV 29, 1999 RE02
SARR & SARP
PLOT 29
RL -80.00 dBm
MKR #1 FRQ 399.988 MHz
-126.77 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
399.988 MHz
-126.77 dBm
1
B
-125 dBm
AMSU-A2
SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
START 396.000 MHz
*RB 3.00 kHz
VB 3.00 kHz
STOP 401.500 MHz
ST 1.833 sec

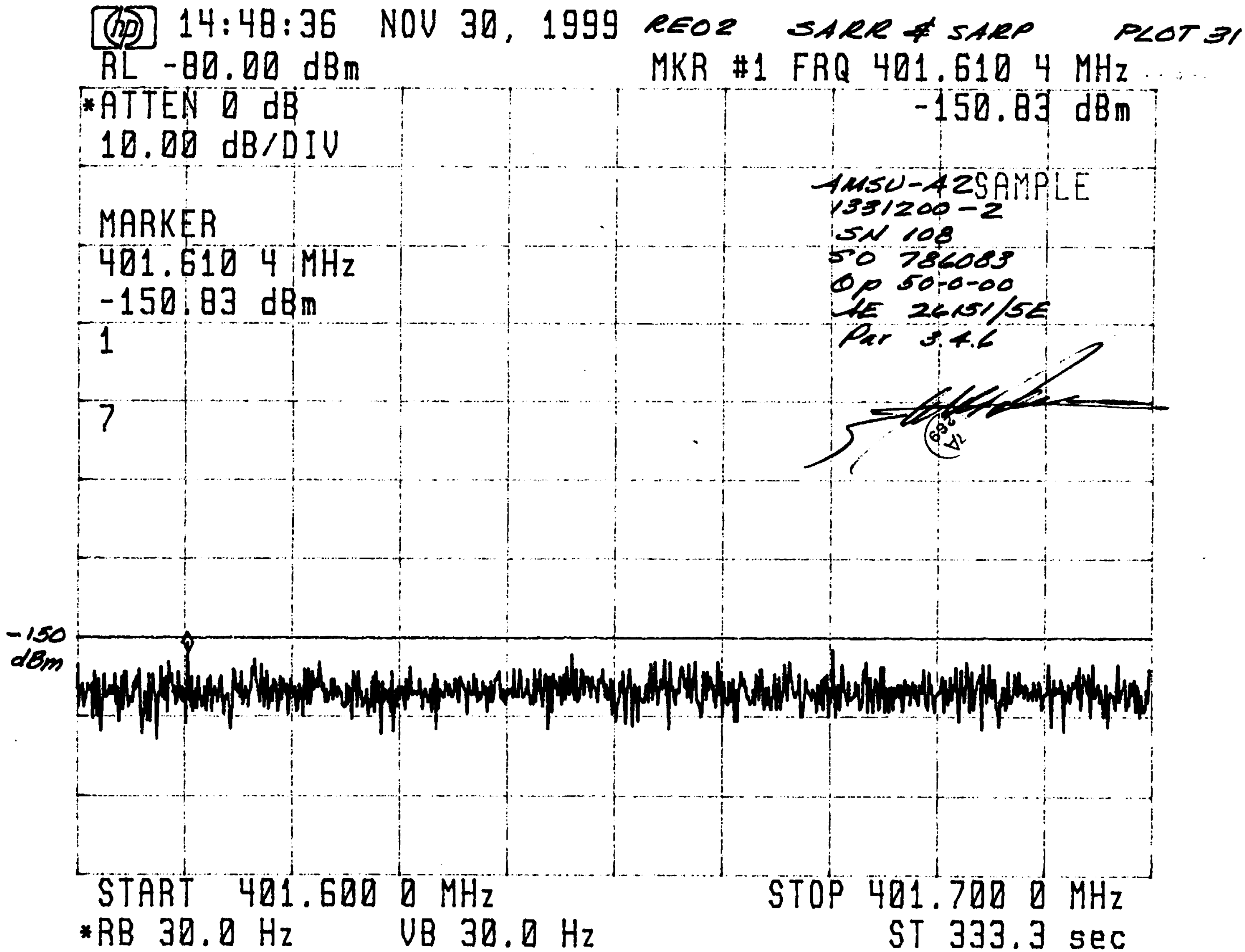
14:57:28 NOV 29, 1999 RE02 SARR & SARP PLOT 30

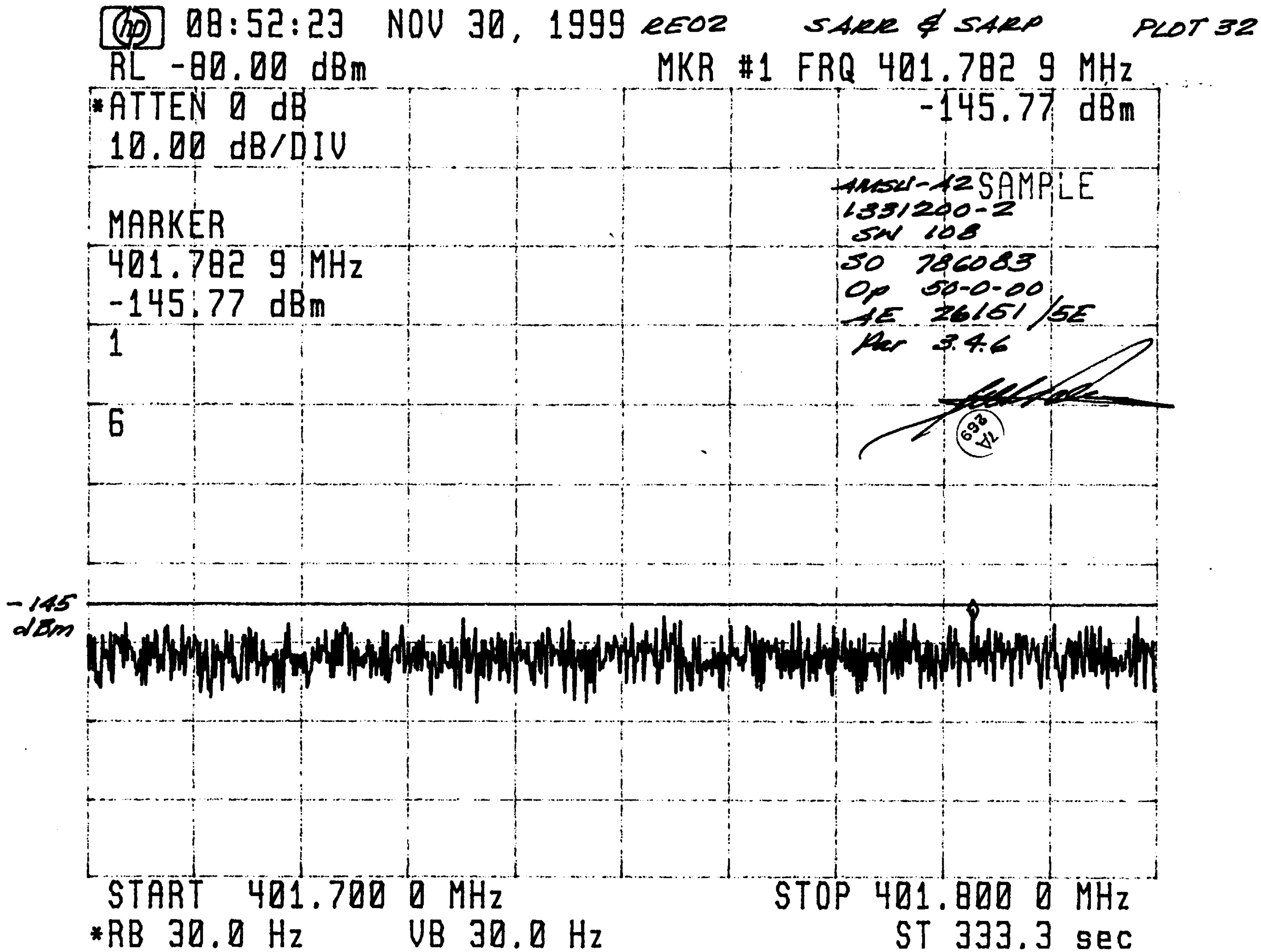
RL -80.00 dBm MKR #1 FRQ 401.590 5 MHz

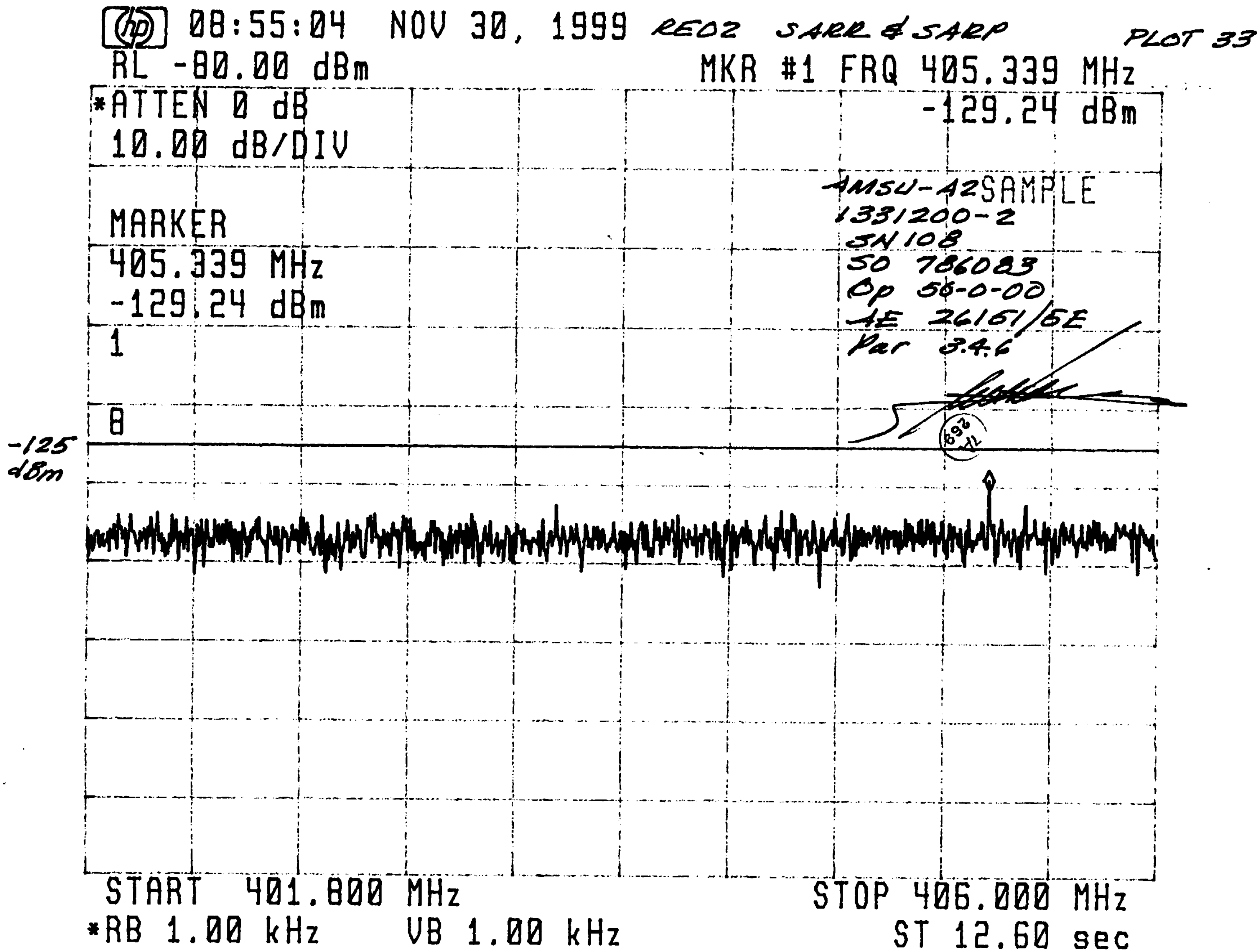


START 401.500 0 MHz STOP 401.600 0 MHz

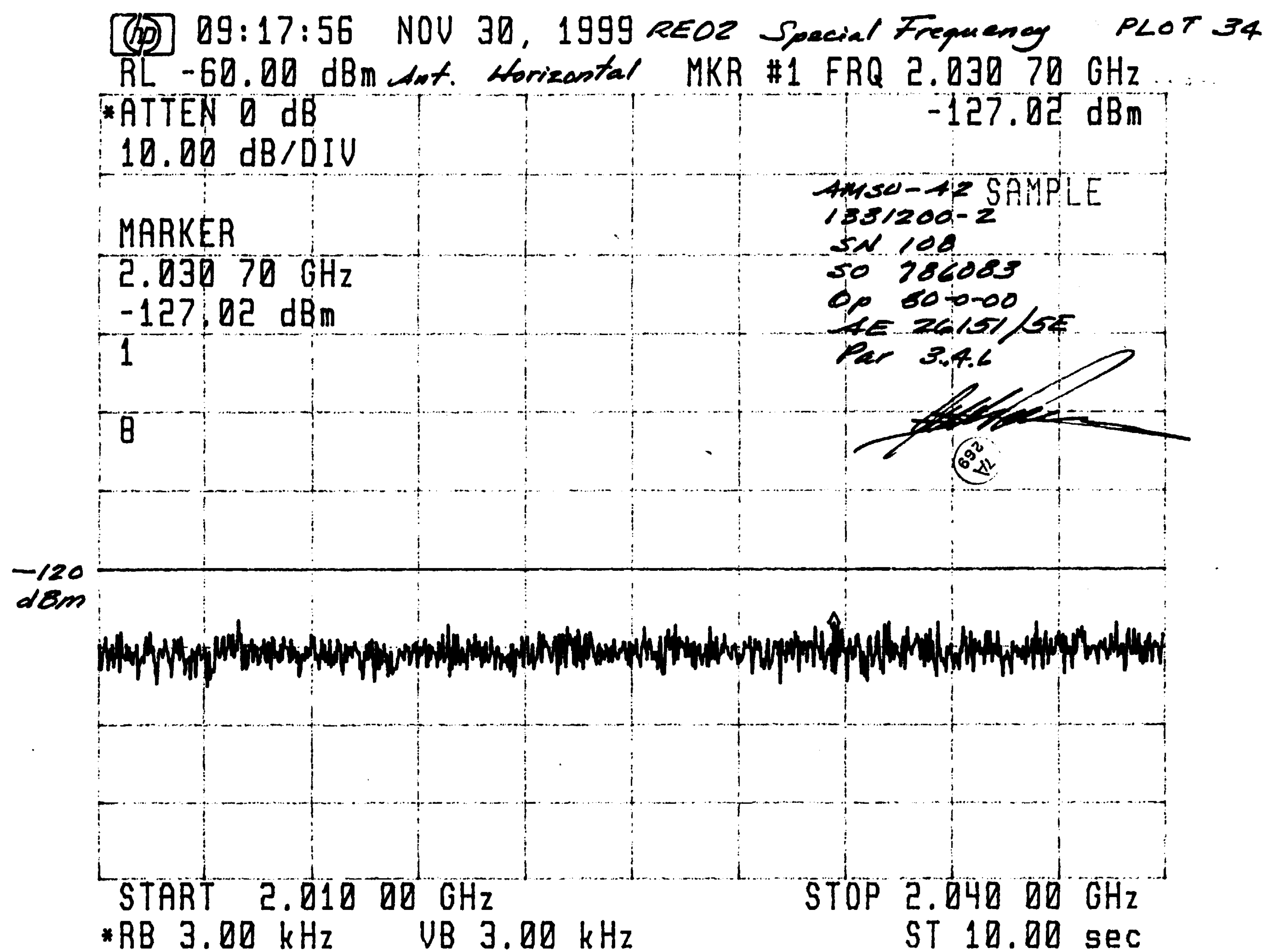
*RB 30.0 Hz VB 30.0 Hz ST 333.3 sec

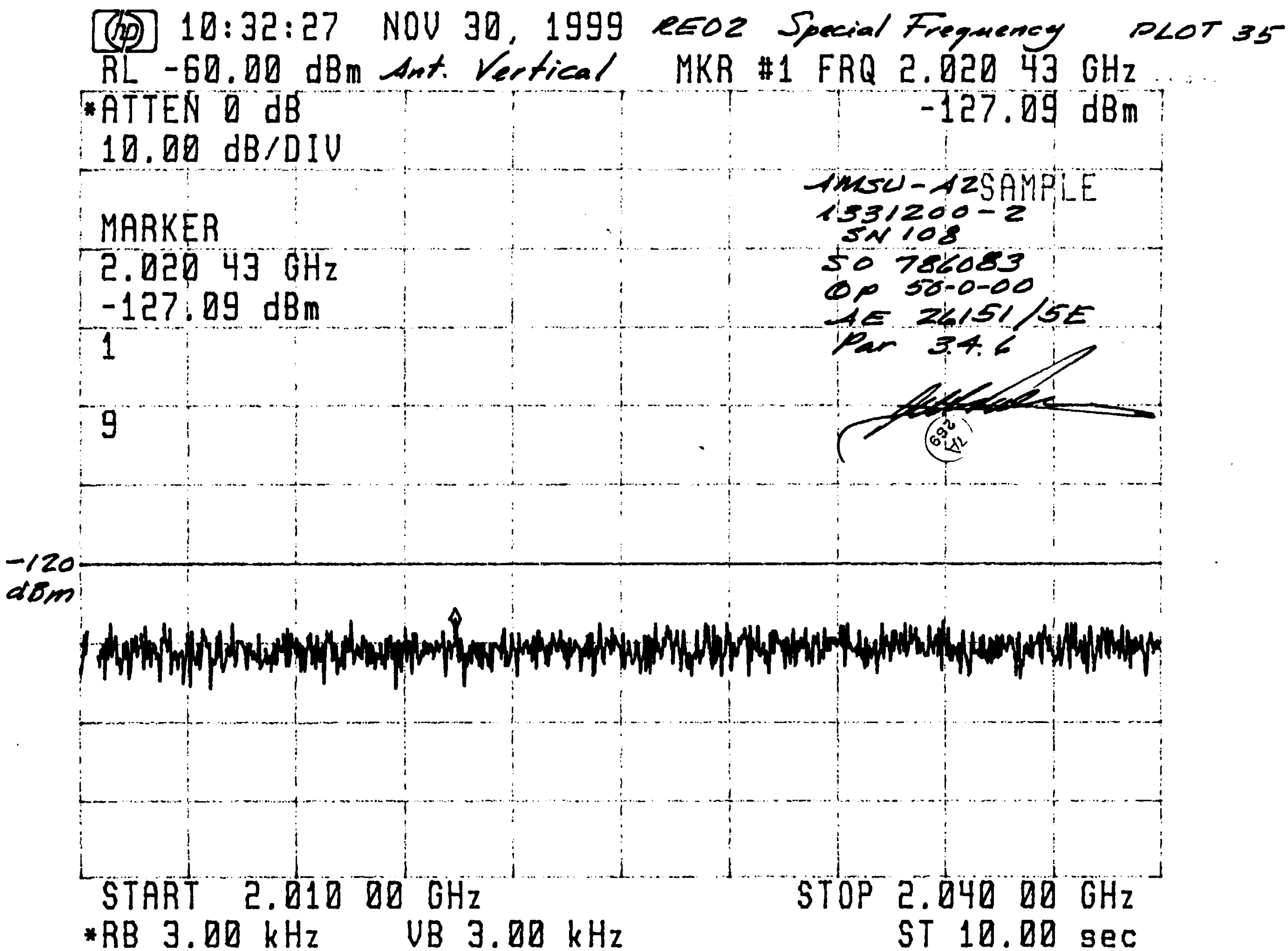

14:48:36 NOV 30, 1999
REO2
SARR & SARP
PLOT 31
RL -80.00 dBm
MKR #1 FRQ 401.610 4 MHz
*ATTEN 0 dB
-150.83 dBm
10.00 dB/DIV
MARKER
401.610 4 MHz
-150.83 dBm
1
7
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
OP 50-0-00
AE 26151/5E
Par 3.4.6
-150 dBm
START 401.600 0 MHz
STOP 401.700 0 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 333.3 sec

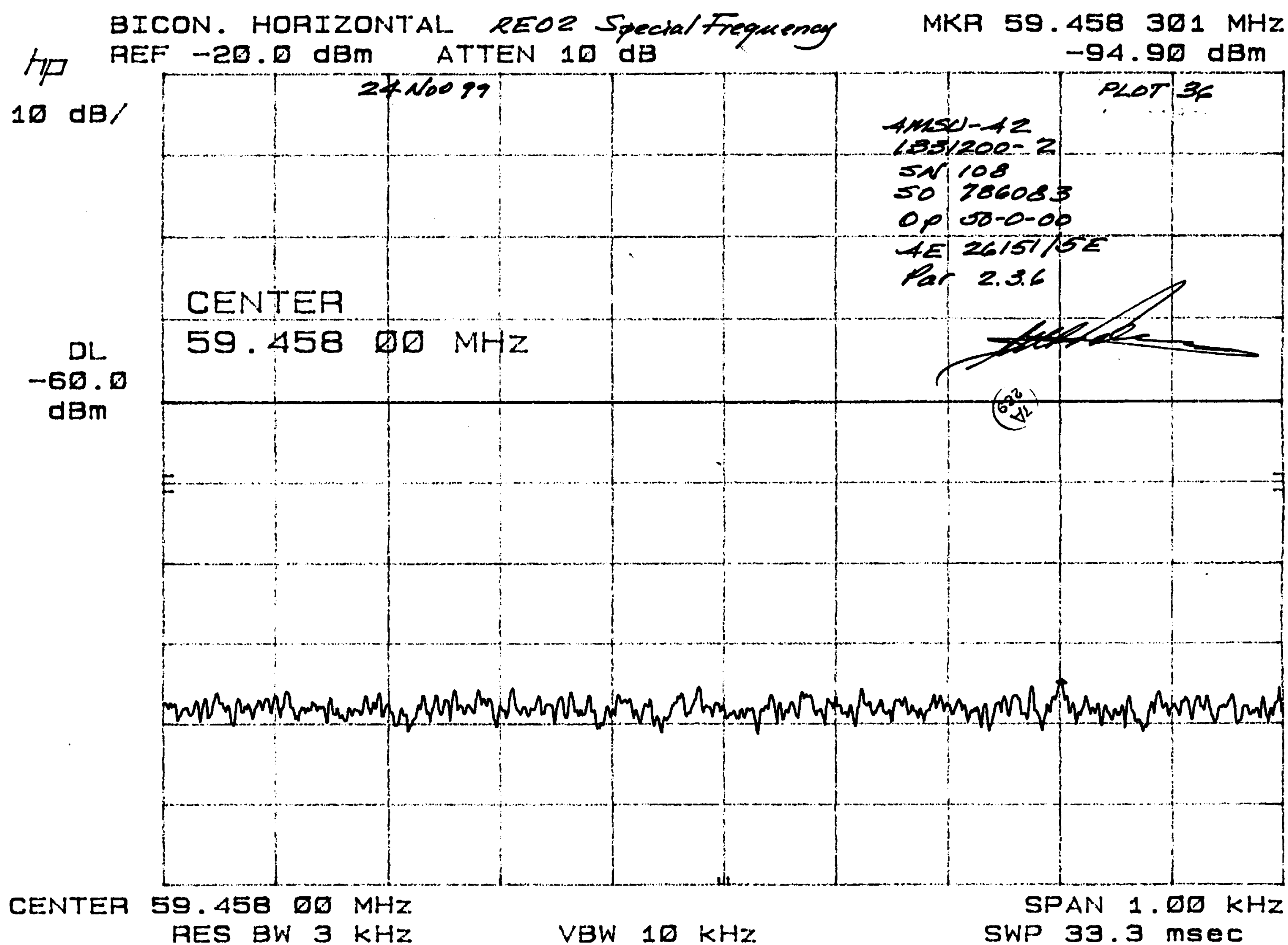

08:52:23 NOV 30, 1999 RE02
SARR & SARP
PLOT 32
RL -80.00 dBm
MKR #1 FRQ 401.782 9 MHz
*ATTEN 0 dB
-145.77 dBm
10.00 dB/DIV
MARKER
401.782 9 MHz
-145.77 dBm
1
6
~~AMSU-A2~~ SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
7A
269
-145 dBm
START 401.700 0 MHz
STOP 401.800 0 MHz
*RB 30.0 Hz
VB 30.0 Hz
ST 333.3 sec



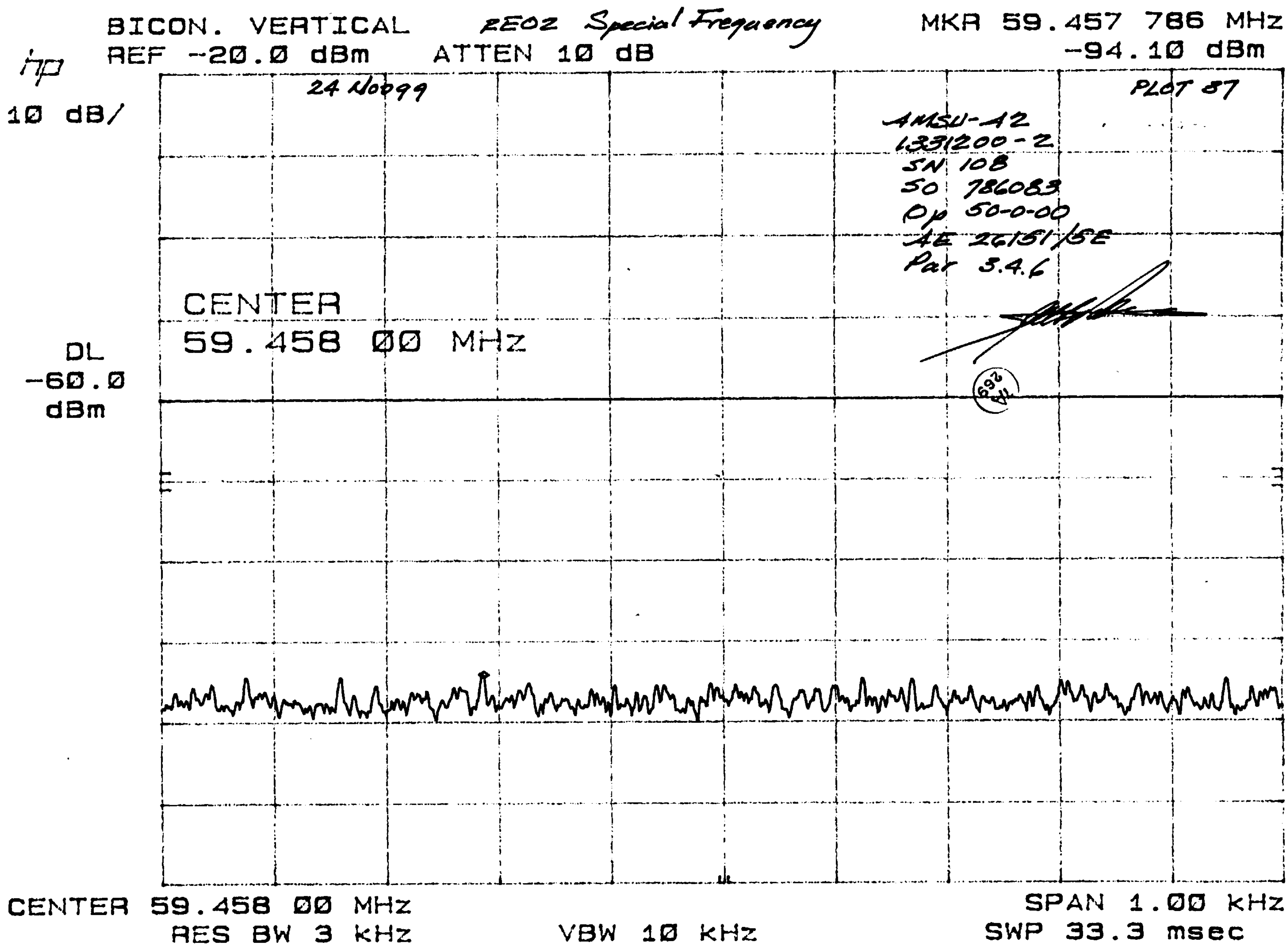
08:55:04 NOV 30, 1999 REO2 SARR & SARP
PLOT 33
RL -80.00 dBm
MKR #1 FRQ 405.339 MHz
-129.24 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
405.339 MHz
-129.24 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 56-0-00
AE 26161/6E
Par 3.4.6
-125 dBm
START 401.800 MHz
STOP 406.000 MHz
*RB 1.00 kHz
VB 1.00 kHz
ST 12.60 sec


09:17:56 NOV 30, 1999 RE02 Special Frequency PLOT 34
RL -60.00 dBm Ant. Horizontal MKR #1 FRQ 2.030 70 GHz
-127.02 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
2.030 70 GHz
-127.02 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 80-0-00
AE 26151/5E
Par 3.4.6
7A
269
-120
dBm
START 2.010 00 GHz
STOP 2.040 00 GHz
*RB 3.00 kHz
VB 3.00 kHz
ST 10.00 sec

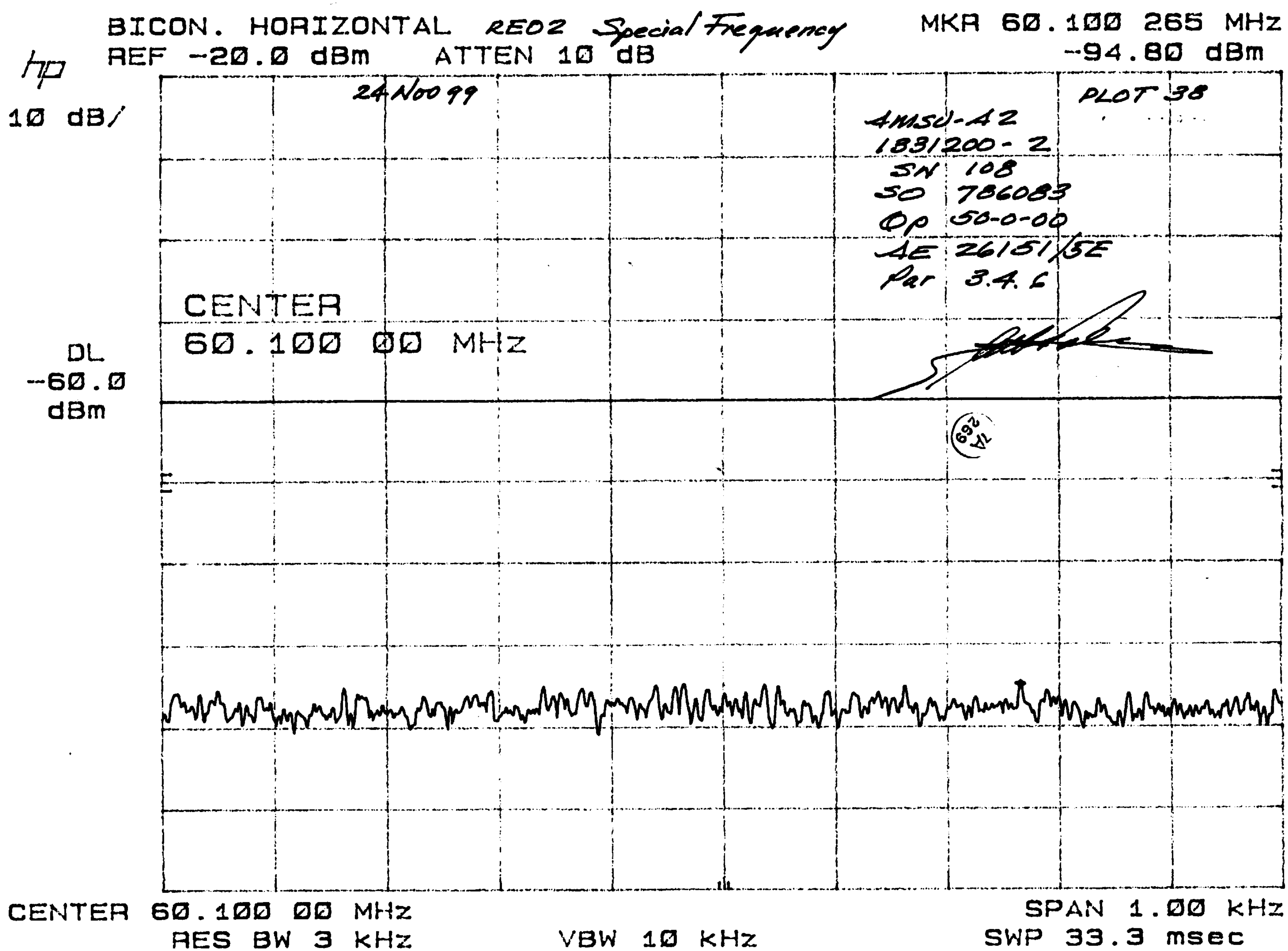

10:32:27 NOV 30, 1999
RE02 Special Frequency
PLOT 35
RL -60.00 dBm
Ant. Vertical
MKR #1 FRQ 2.020 43 GHz
-127.09 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
2.020 43 GHz
-127.09 dBm
1
9
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
-120 dBm
START 2.010 00 GHz
STOP 2.040 00 GHz
*RB 3.00 kHz
VB 3.00 kHz
ST 10.00 sec

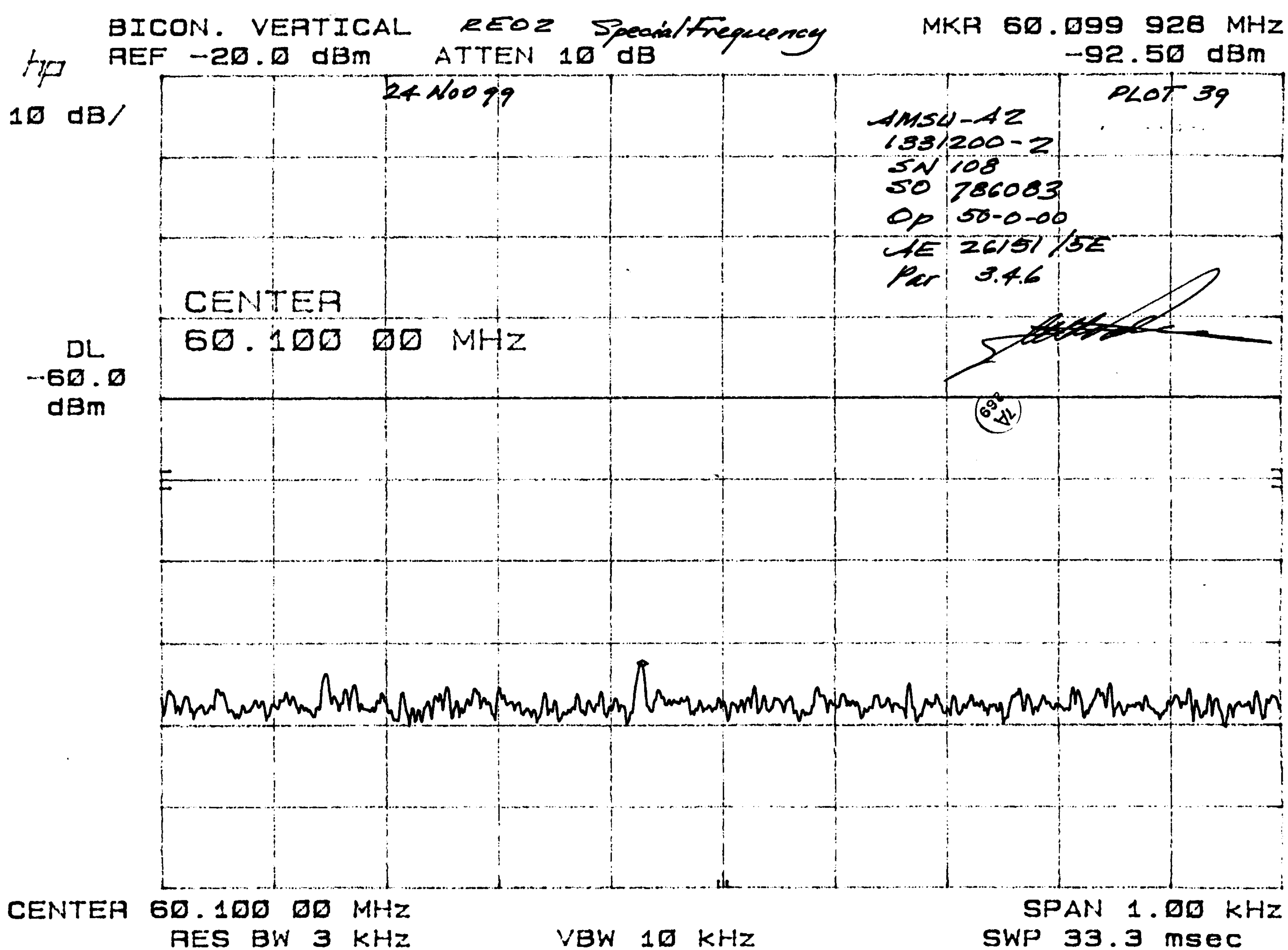


BICON. HORIZONTAL
RE02 Special/Frequency
MKR 59.458 301 MHz
REF -20.0 dBm
ATTEN 10 dB
-94.90 dBm
hp
10 dB/
24 Nov 99
PLOT 36
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 2.3.6
CENTER
59.458 00 MHz
DL
-60.0
dBm
CENTER 59.458 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

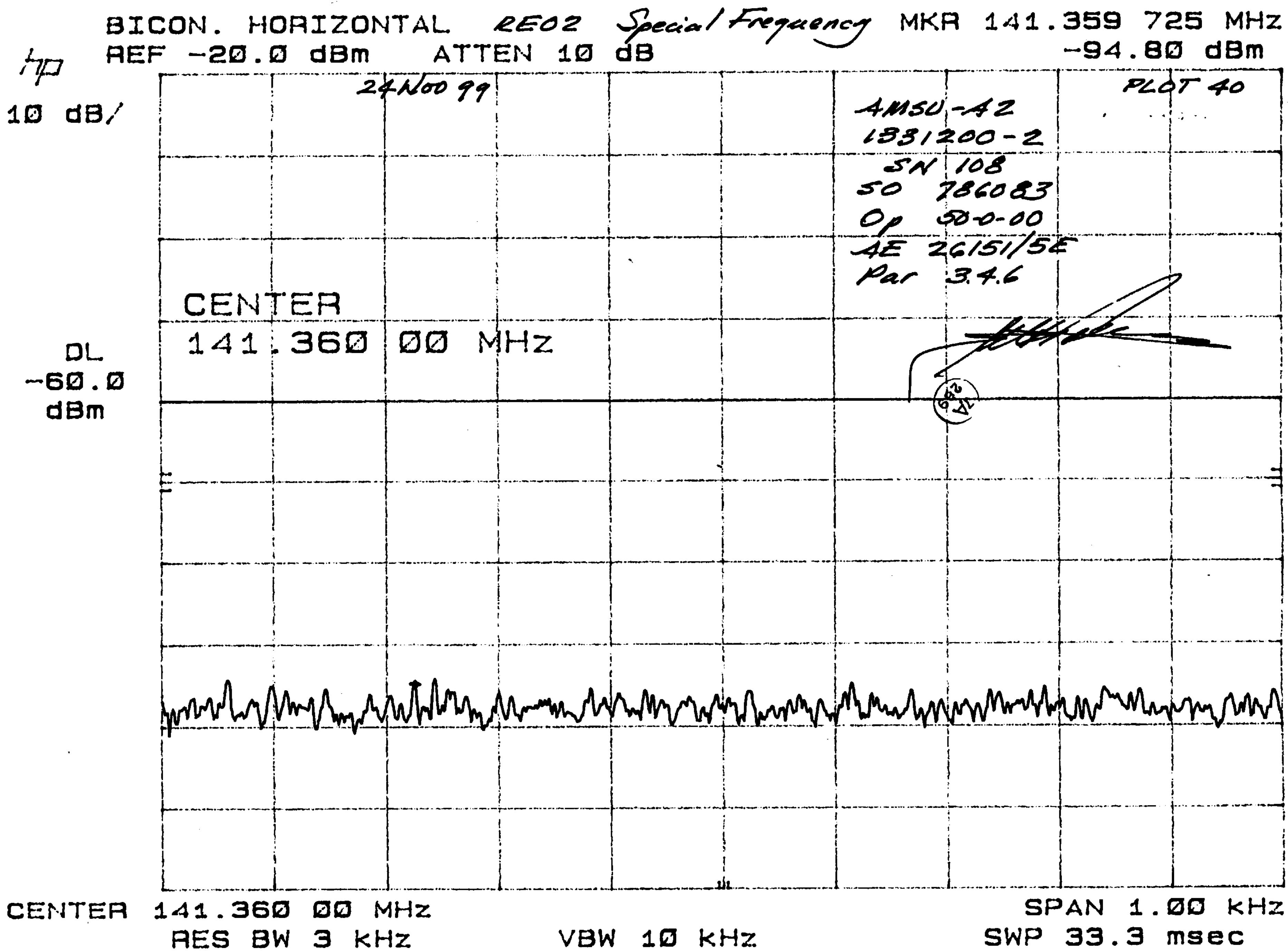


BICON. VERTICAL
2E02 Special Frequency
MKR 59.457 786 MHz
-94.10 dBm
hp
REF -20.0 dBm
ATTEN 10 dB
10 dB/
24 Nov99
PLOT 87
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
CENTER
59.458 00 MHz
DL
-60.0
dBm
CENTER 59.458 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


BICON. HORIZONTAL RE02 Special/Frequency
MKR 60.100 265 MHz
REF -20.0 dBm ATTEN 10 dB
-94.80 dBm
hp
10 dB/
24 Nov 99
PLOT 38
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
CENTER
60.100 00 MHz
DL
-60.0
dBm
TA
269
CENTER 60.100 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec



hp
BICON. VERTICAL REO2 Special/Frequency
REF -20.0 dBm ATTEN 10 dB
MKR 60.099 928 MHz
-92.50 dBm
10 dB/
24 Nov 99
PLOT 39
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
60.100 00 MHz
DL
-60.0
dBm
CENTER 60.100 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec



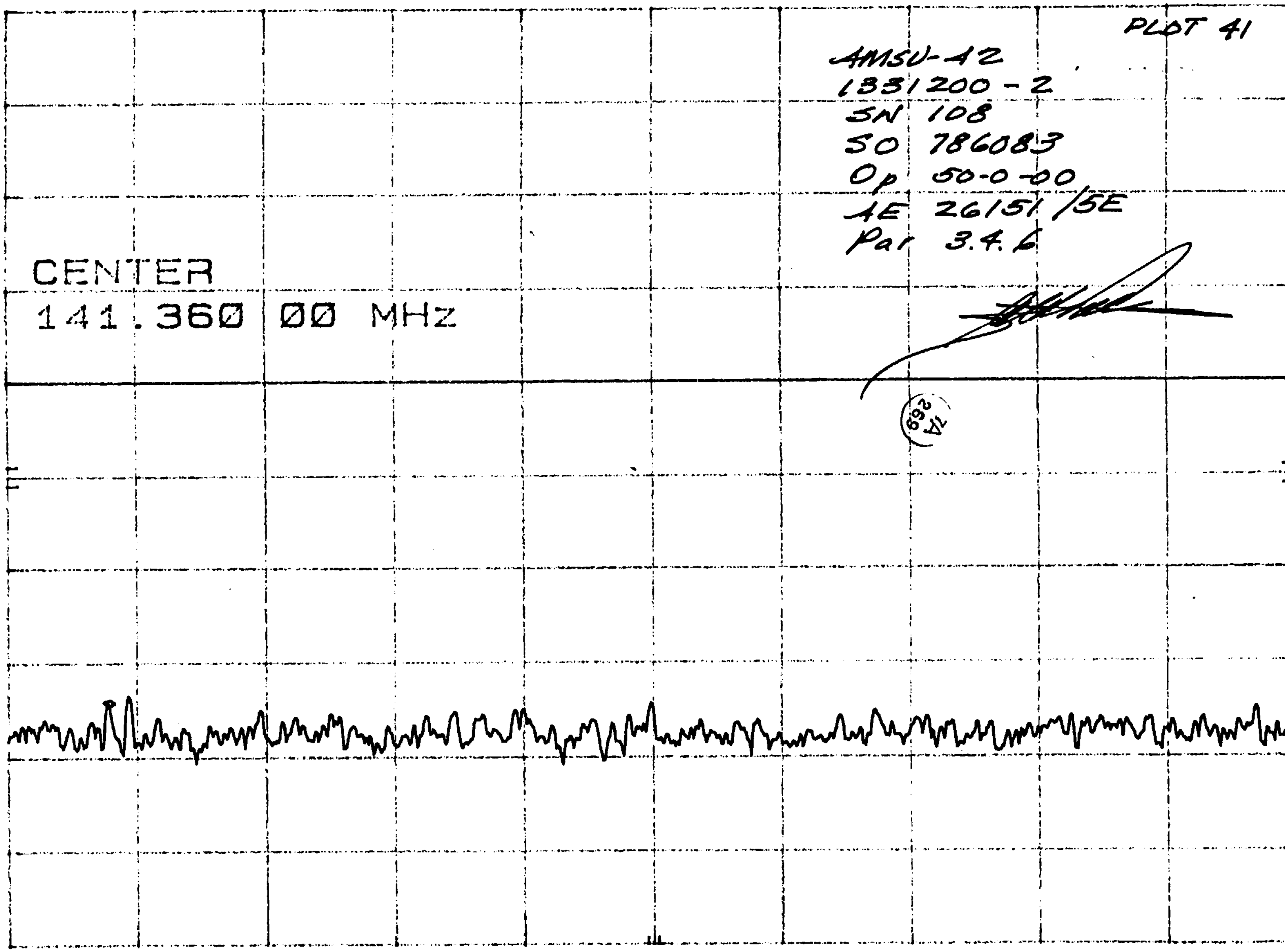
BICON. HORIZONTAL
RE02 Special/Frequency
MKR 141.359 725 MHz
REF -20.0 dBm
ATTEN 10 dB
-94.80 dBm
hp
10 dB/
24Nov99
PLOT 40
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
141.360 00 MHz
DL
-60.0
dBm
CENTER 141.360 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

BICON. VERTICAL REO2 Special Frequency MKR 141.359 578 MHz
REF -20.0 dBm ATTEN 10 dB -94.20 dBm

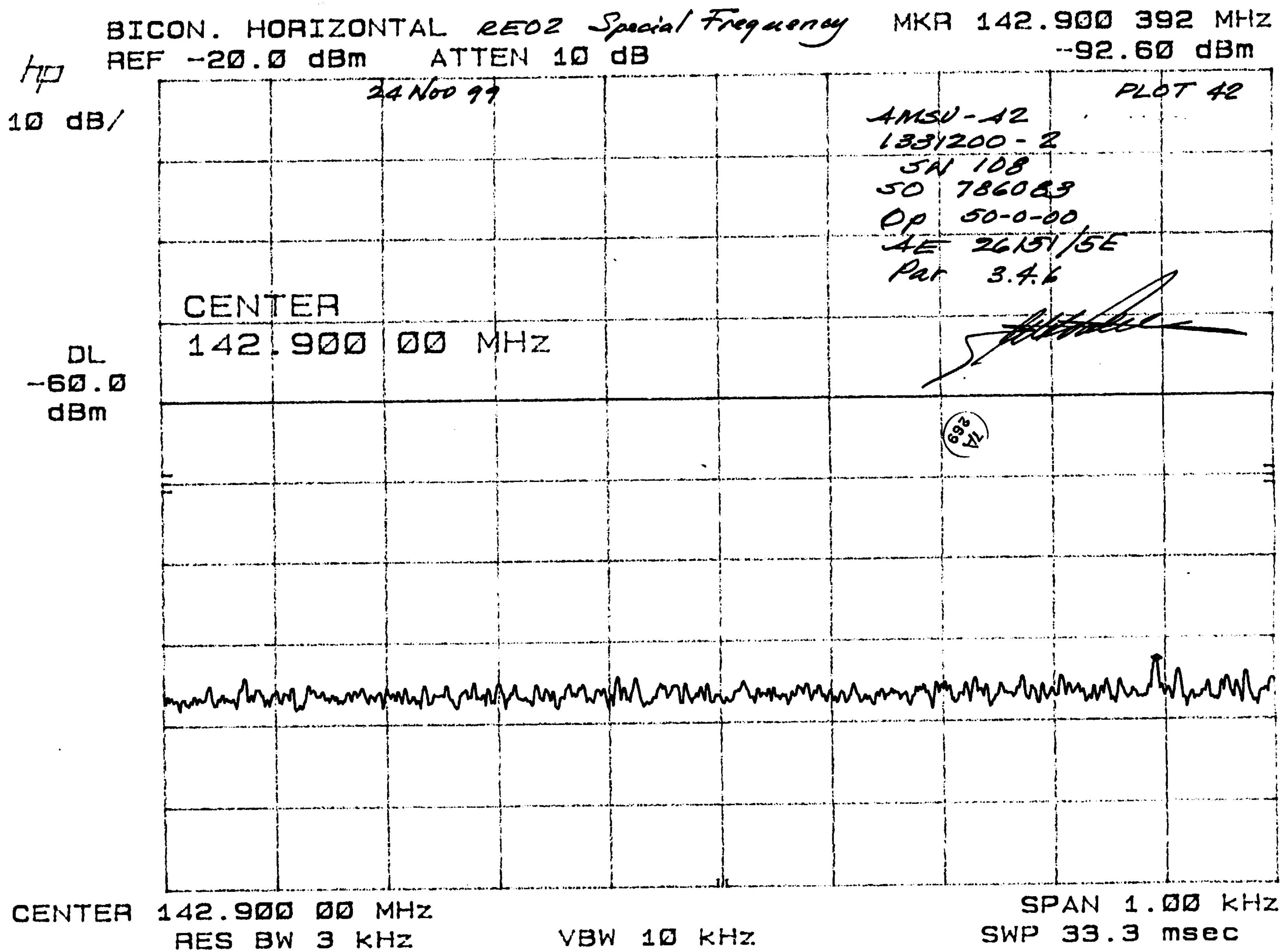
hp

10 dB/

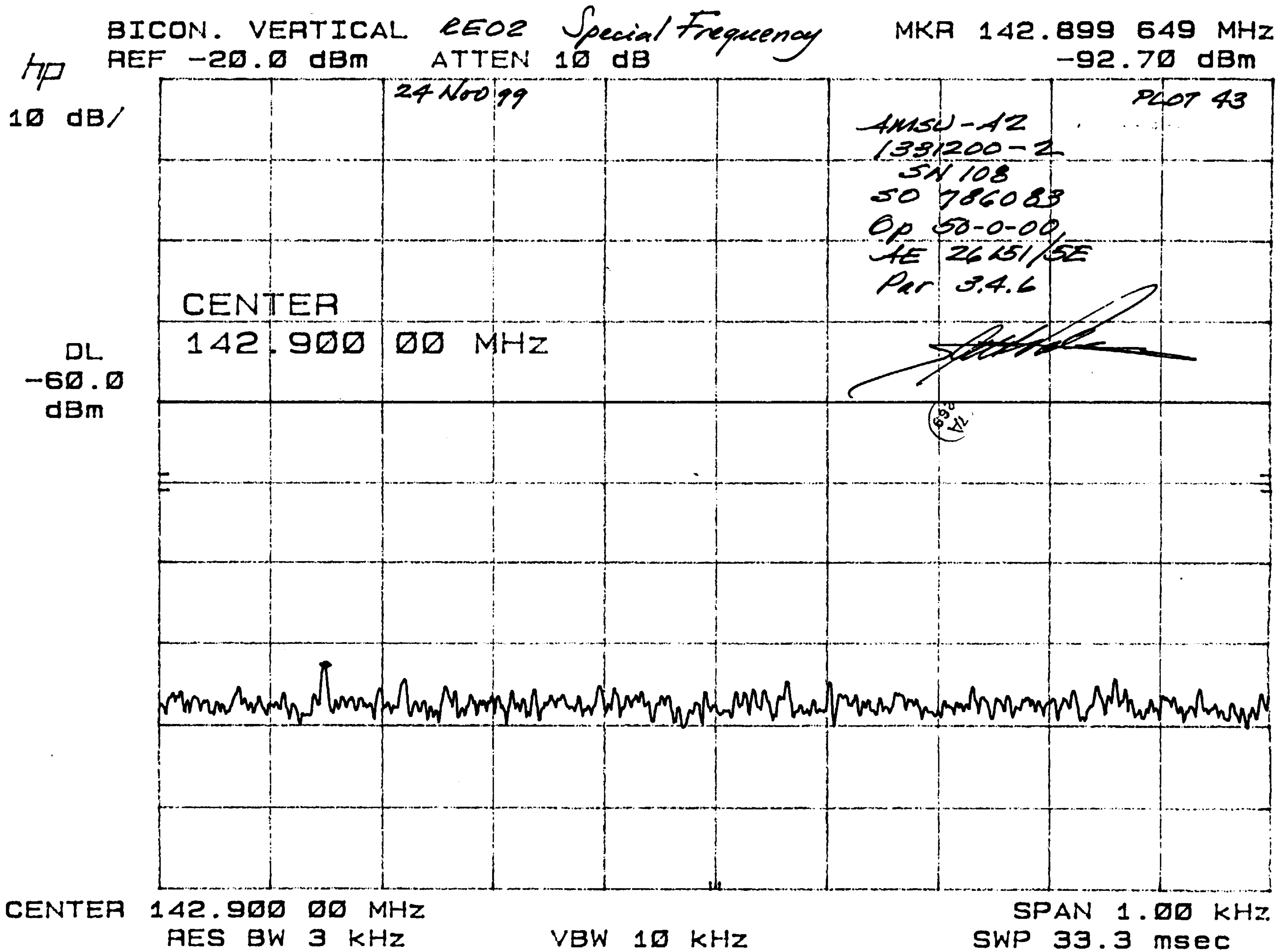
DL
-60.0
dBm



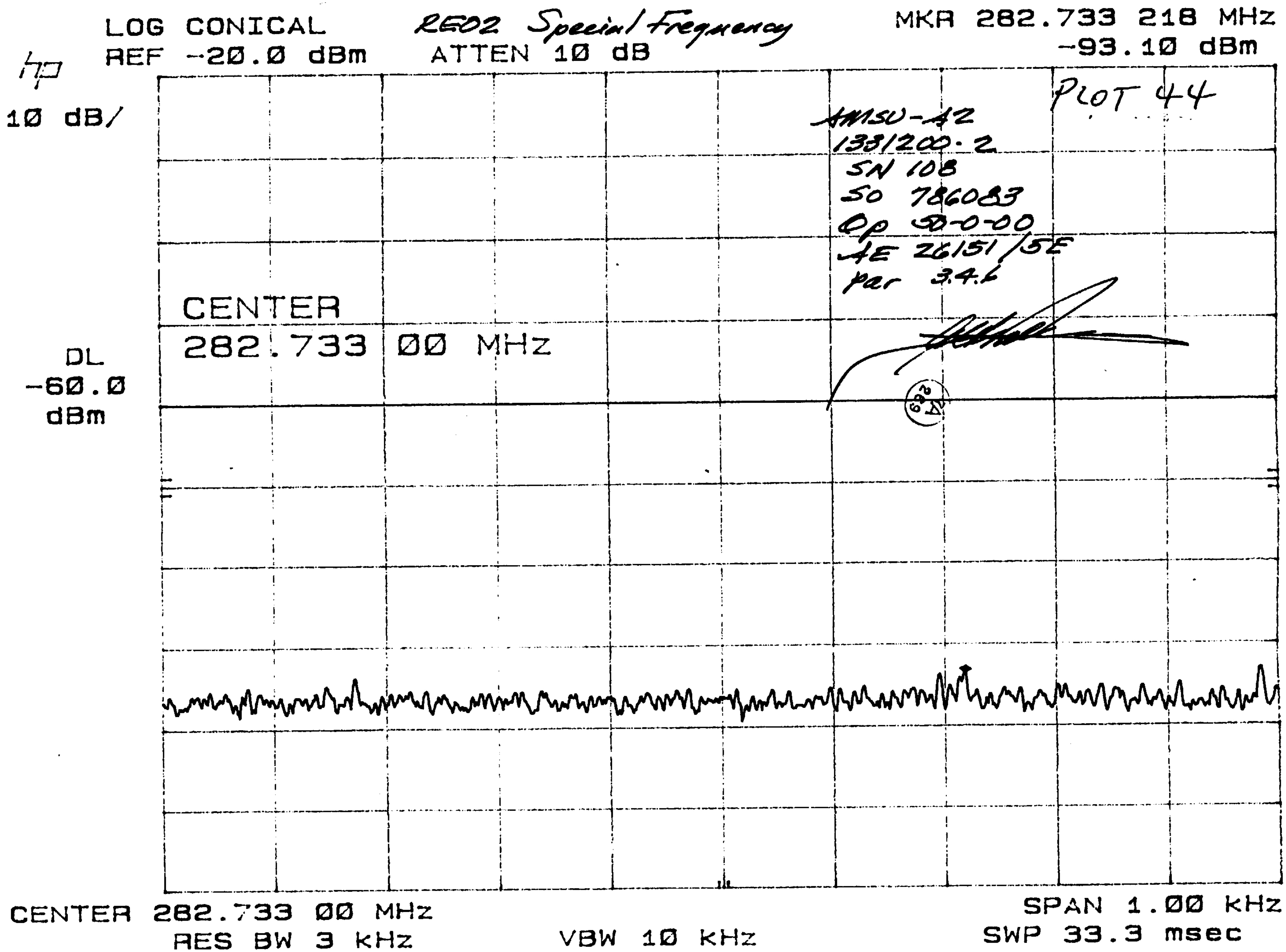
CENTER 141.360 00 MHz SPAN 1.00 kHz
RES BW 3 kHz VBW 10 kHz SWP 33.3 msec

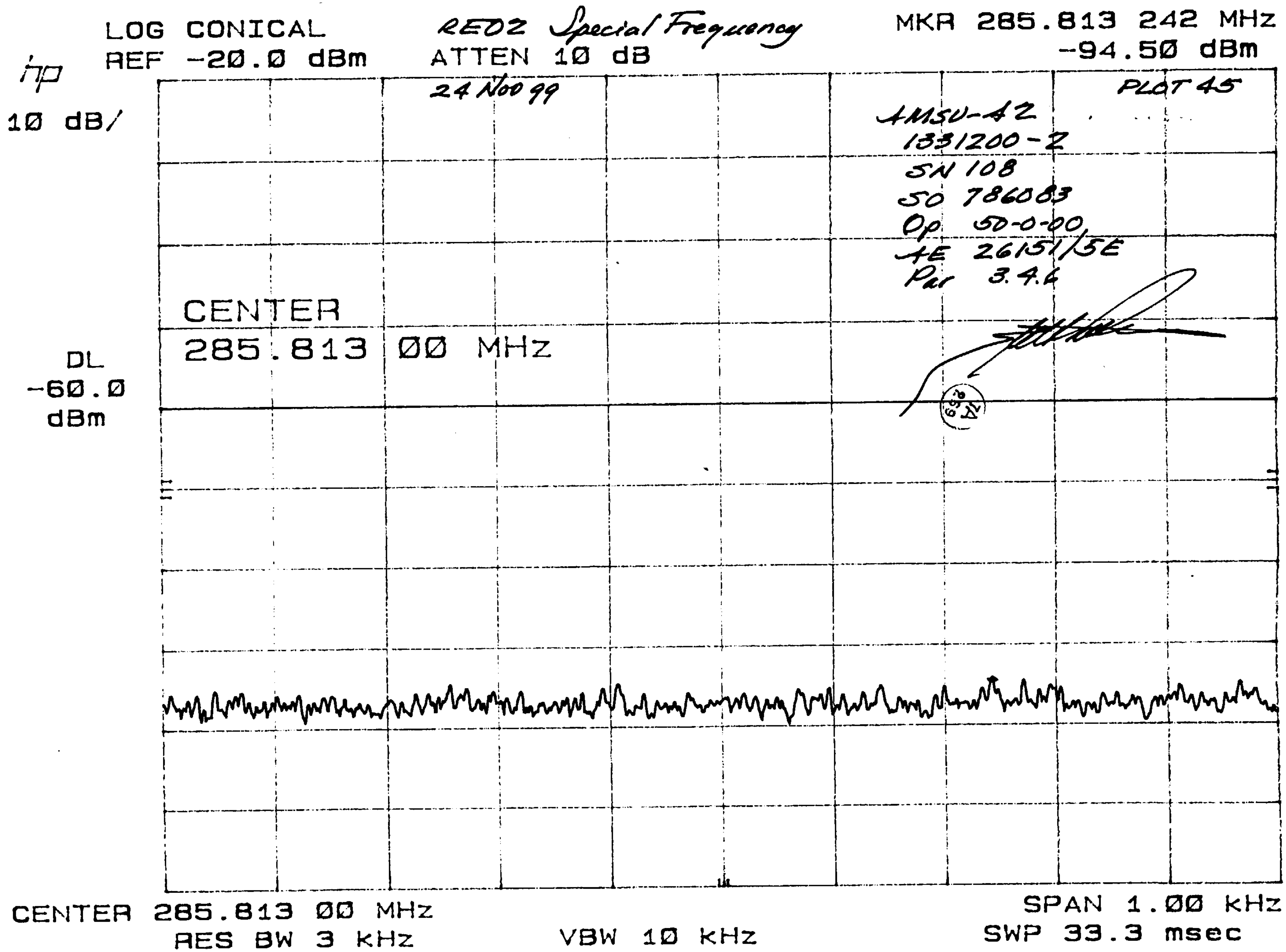


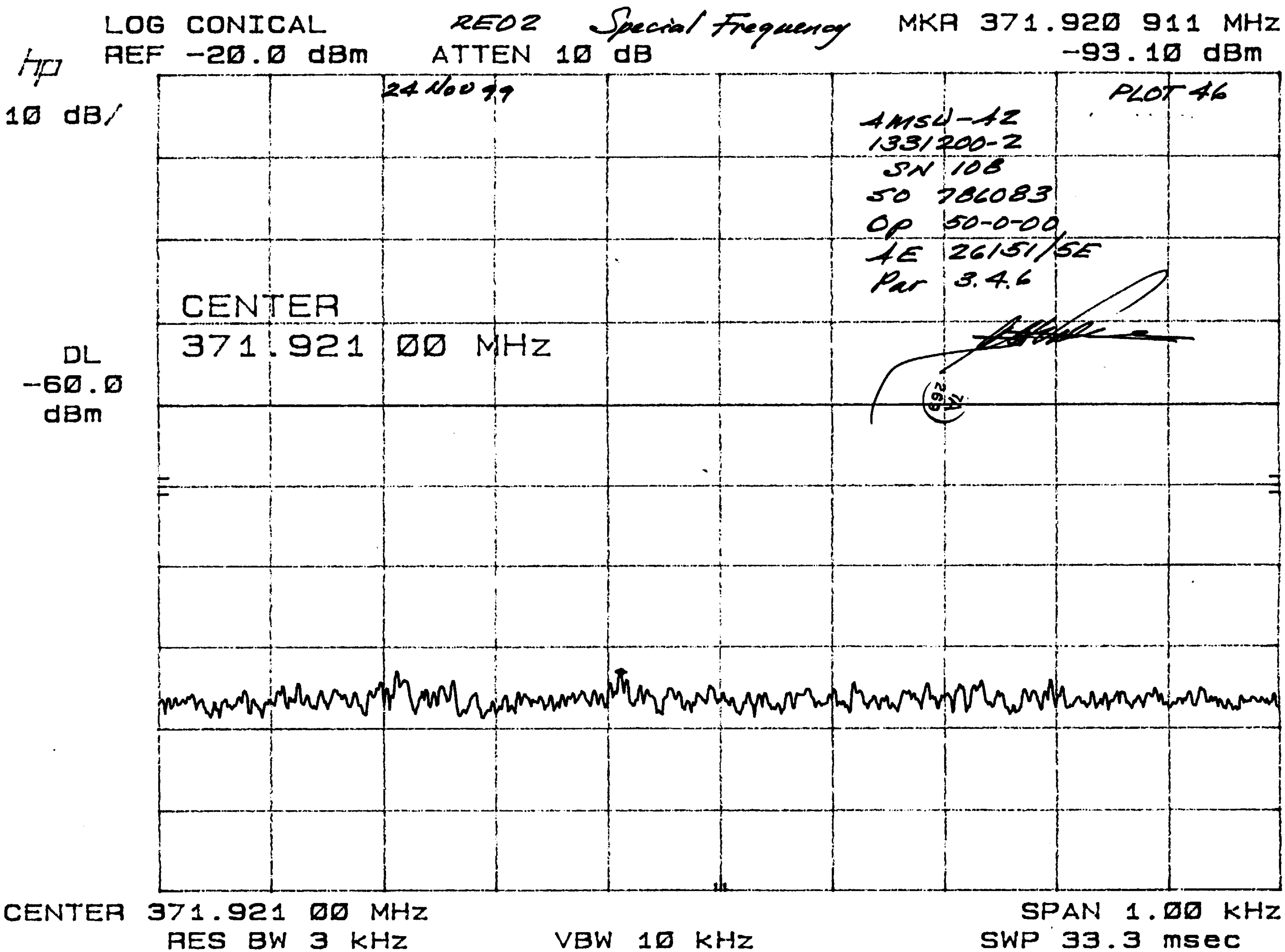
BICON. HORIZONTAL RE02 Special Frequency
MKR 142.900 392 MHz
-92.60 dBm
REF -20.0 dBm ATTEN 10 dB
hp
10 dB/
24 Nov 99
PLOT 42
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
142.900 00 MHz
DL
-60.0
dBm
TA
269
CENTER 142.900 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

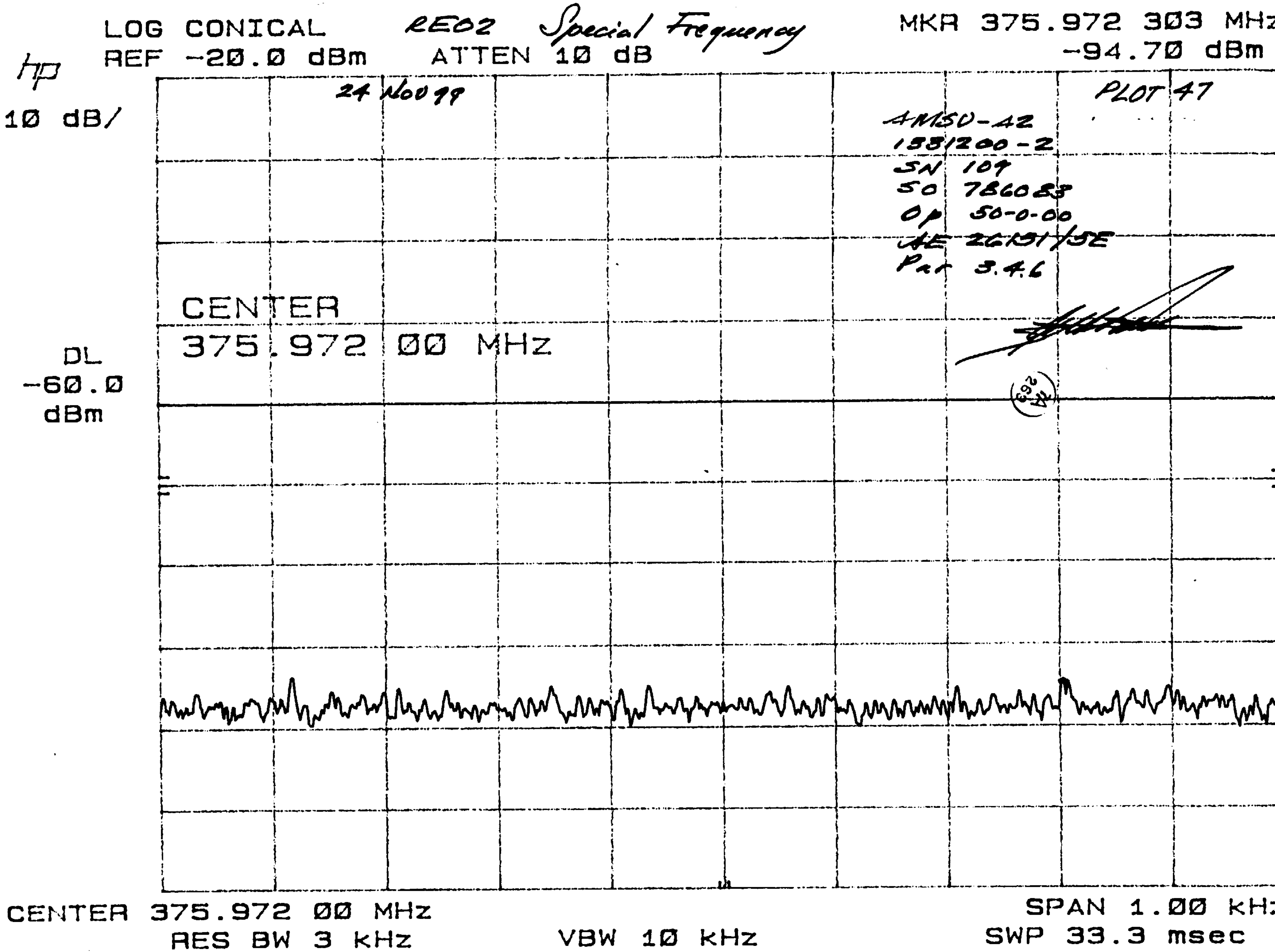


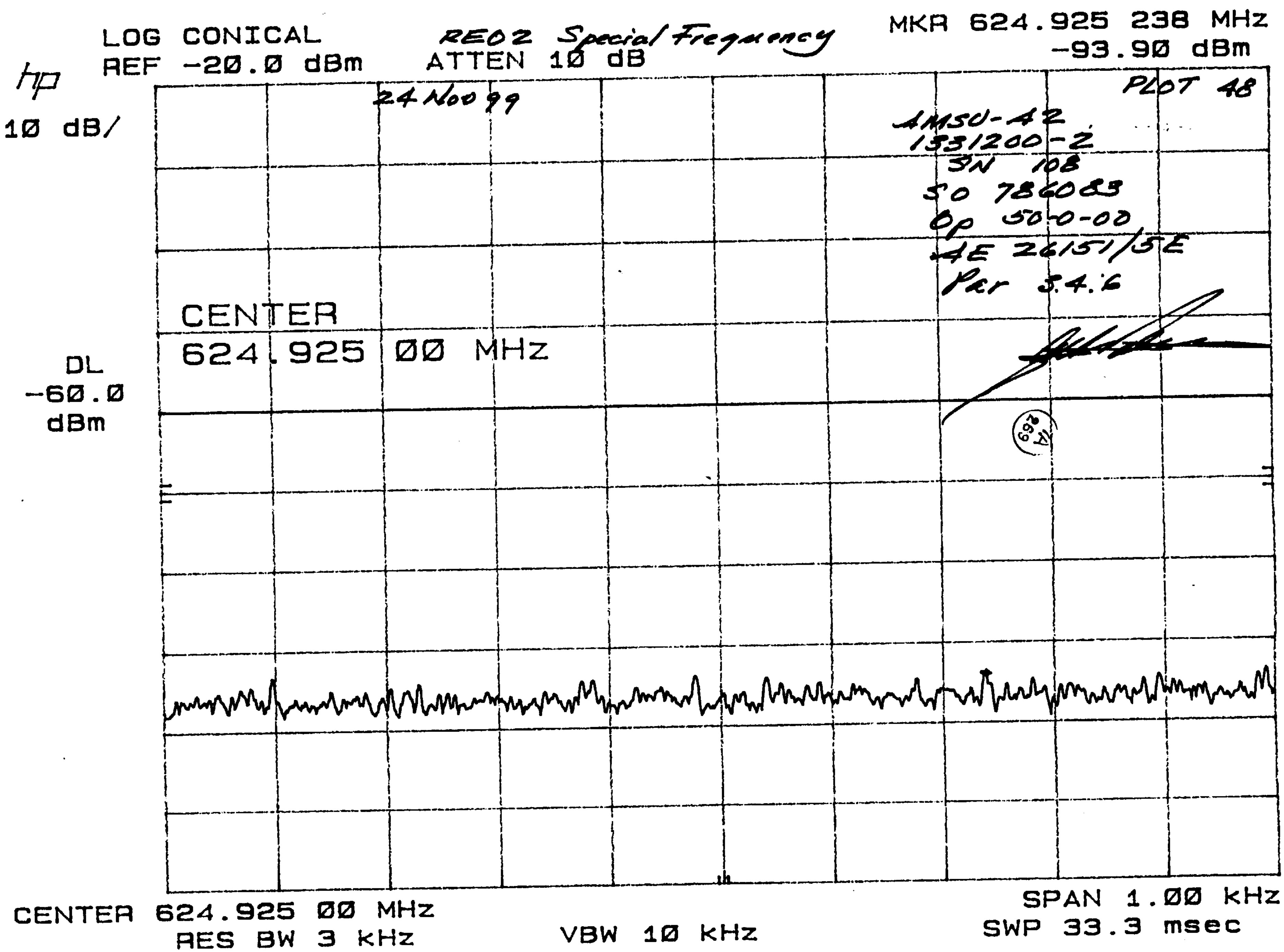
BICON. VERTICAL RE02 Special Frequency
MKR 142.899 649 MHz
REF -20.0 dBm
ATTEN 10 dB
-92.70 dBm
10 dB/
24 Nov 99
PLOT 43
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
CENTER
142.900 00 MHz
DL
-60.0
dBm
CENTER 142.900 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


LOG CONICAL
REF -20.0 dBm
RE02 Special Frequency
ATTEN 10 dB
MKR 282.733 218 MHz
-93.10 dBm
10 dB/
PLOT 44
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
par 3.4.6
CENTER
282.733 00 MHz
DL
-60.0
dBm
CENTER 282.733 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


LOG CONICAL
REF -20.0 dBm
REO2 Special Frequency
ATTEN 10 dB
24 Nov 99
MKR 285.813 242 MHz
-94.50 dBm
PLOT 45
hp
10 dB/
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
285.813 00 MHz
DL
-60.0
dBm
CENTER 285.813 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


LOG CONICAL
REF -20.0 dBm
RE02
ATTEN 10 dB
Special/Frequency
MKR 371.920 911 MHz
-93.10 dBm
hp
10 dB/
24 Nov 99
PLOT 46
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
CENTER
371.921 00 MHz
DL
-60.0
dBm
CENTER 371.921 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


LOG CONICAL
REF -20.0 dBm
ATTEN 10 dB
RE02 Special/ Frequency
MKR 375.972 303 MHz
-94.70 dBm
hp
10 dB/
24 Nov 99
PLOT 47
AMSU-A2
1331200-2
SN 109
SO 786083
Op 50-0-00
AE 26131/5E
Par 3.4.6
CENTER
375.972 00 MHz
DL
-60.0
dBm
CENTER 375.972 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec


hp
LOG CONICAL
REF -20.0 dBm
RE02 Special Frequency
ATTEN 10 dB
MKR 624.925 238 MHz
-93.90 dBm
10 dB/
24 Nov 99
PLOT 48
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
624.925 00 MHz
DL
-60.0
dBm
A
269
CENTER 624.925 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

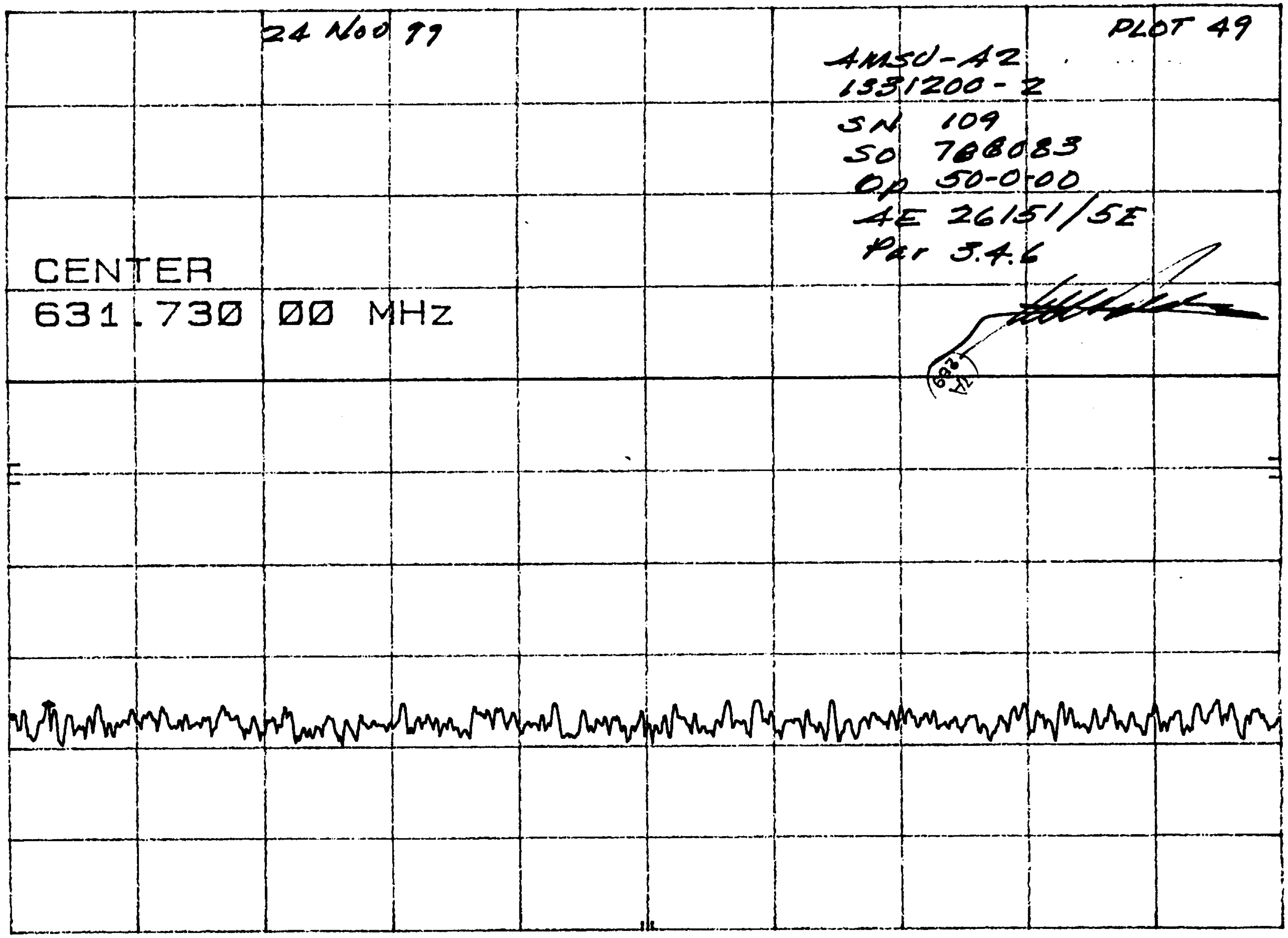
LOG CONICAL REF -20.0 dBm

RE02 Special Frequency ATTEN 10 dB

MKR 631.729 530 MHz -95.10 dBm

hp 10 dB/

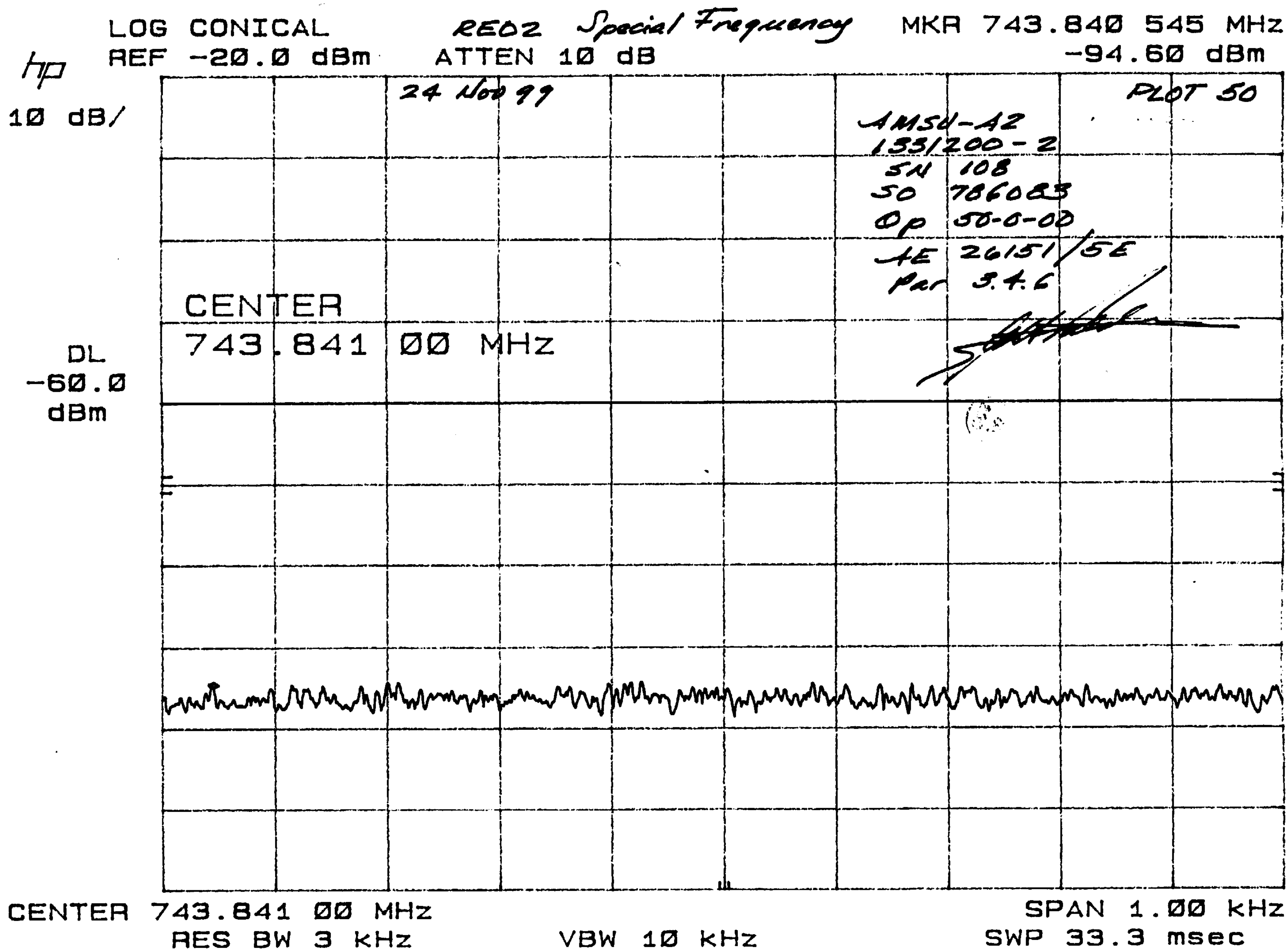
DL -60.0 dBm



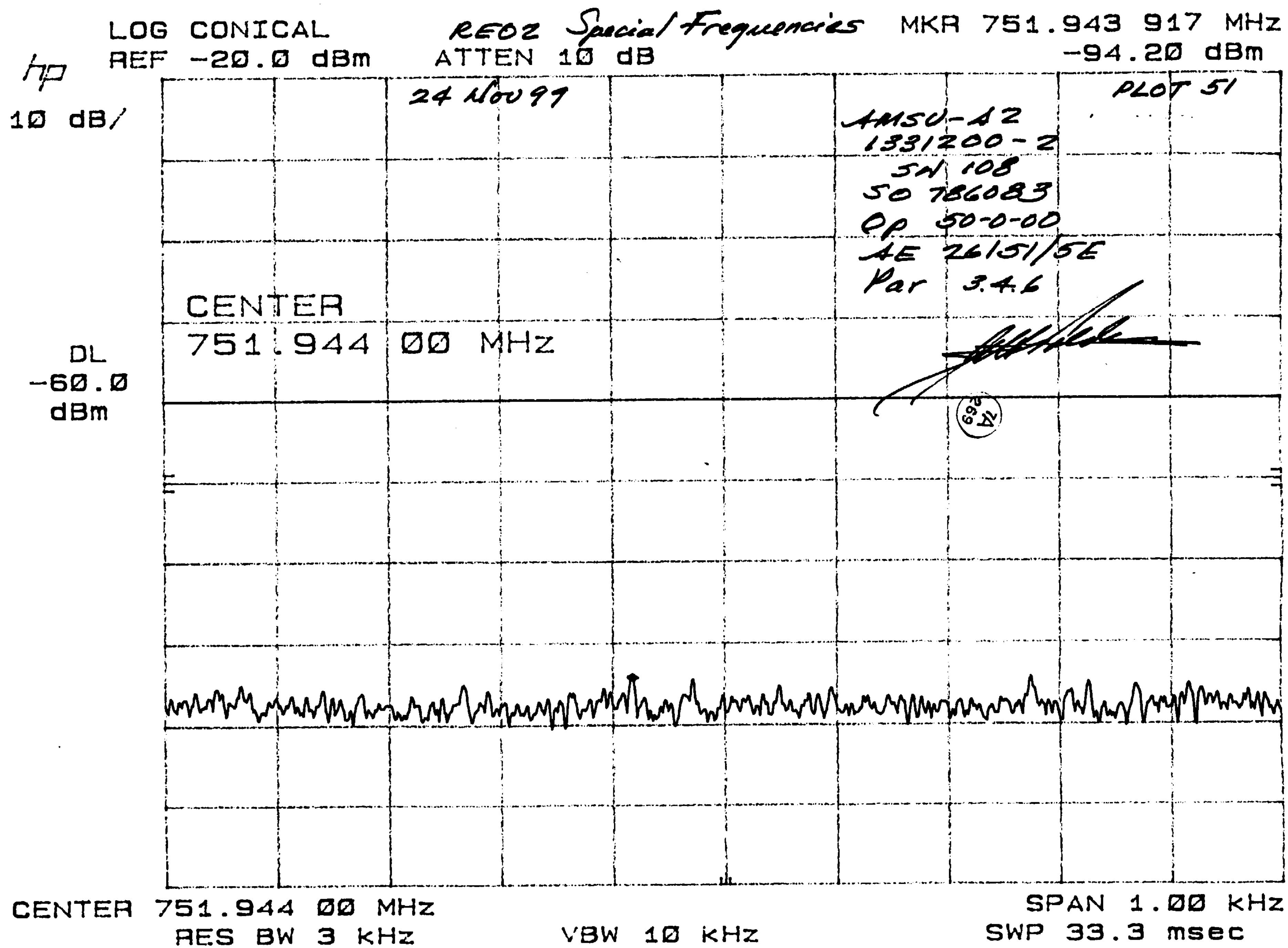
CENTER 631.730 00 MHz
RES BW 3 kHz

VBW 10 kHz

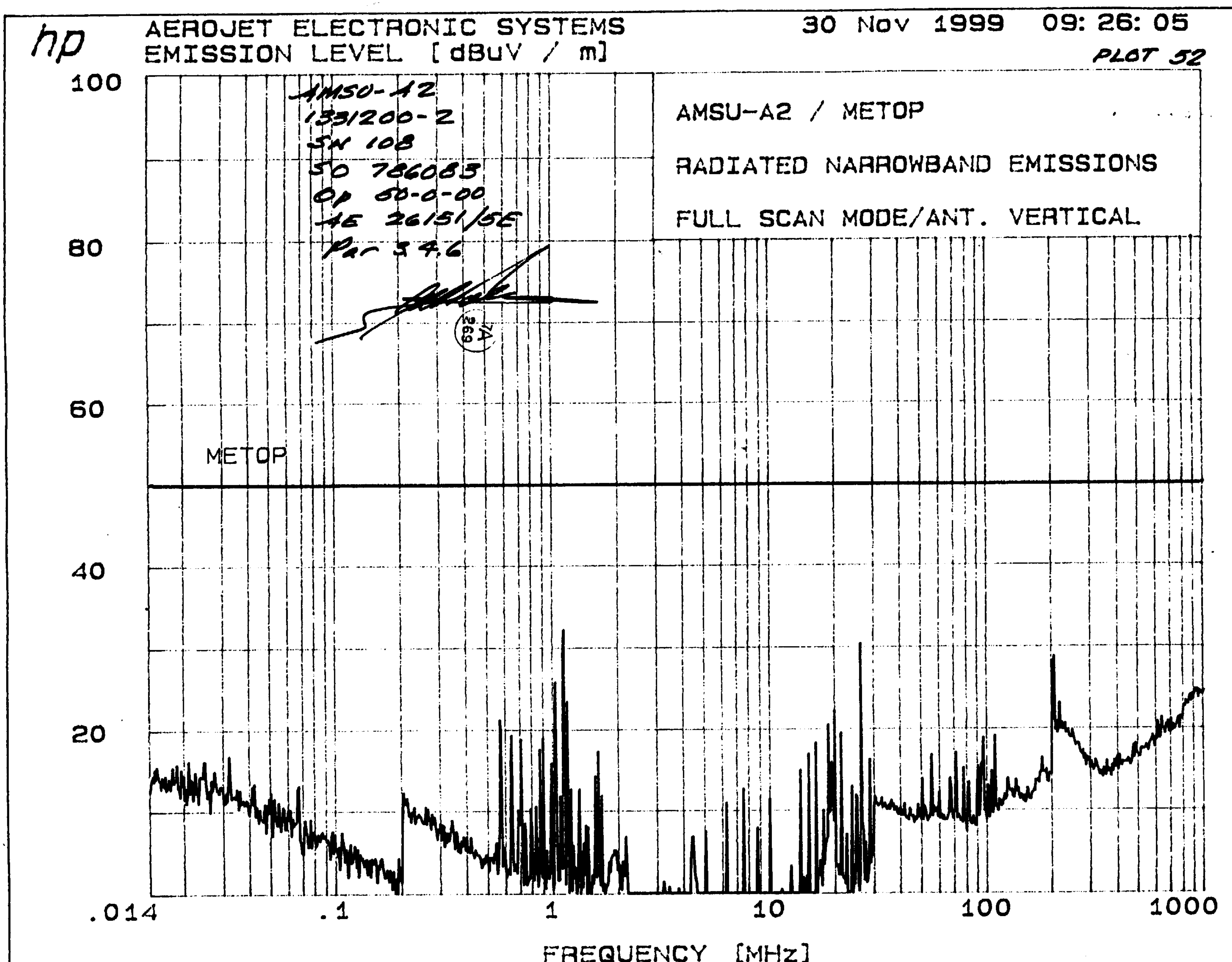
SPAN 1.00 kHz
SWP 33.3 msec



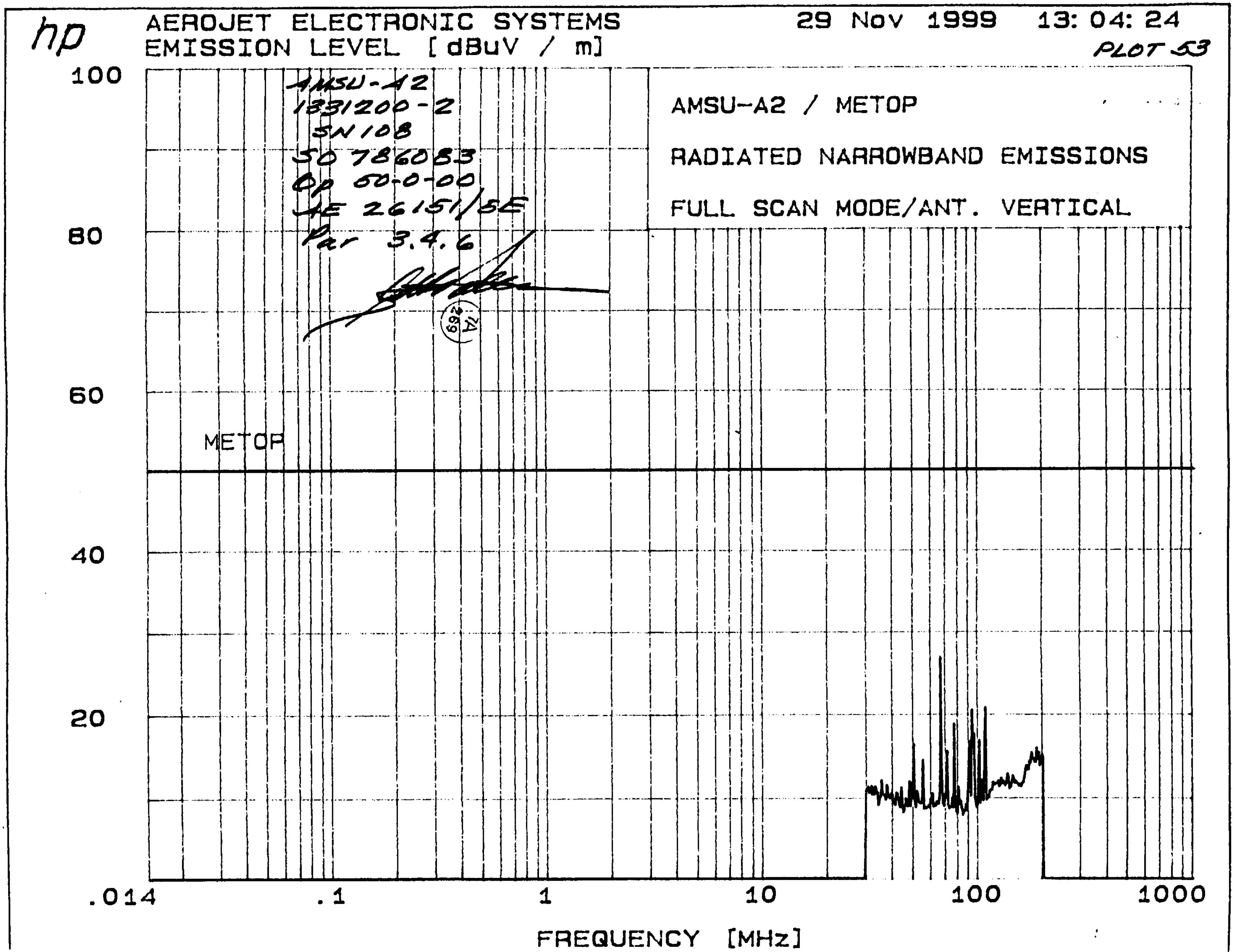
hp
LOG CONICAL
REF -20.0 dBm
10 dB/
REO2 Special Frequency
ATTEN 10 dB
MKR 743.840 545 MHz
-94.60 dBm
24 Nov 99
PLOT 50
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
743.841 00 MHz
DL
-60.0
dBm
CENTER 743.841 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

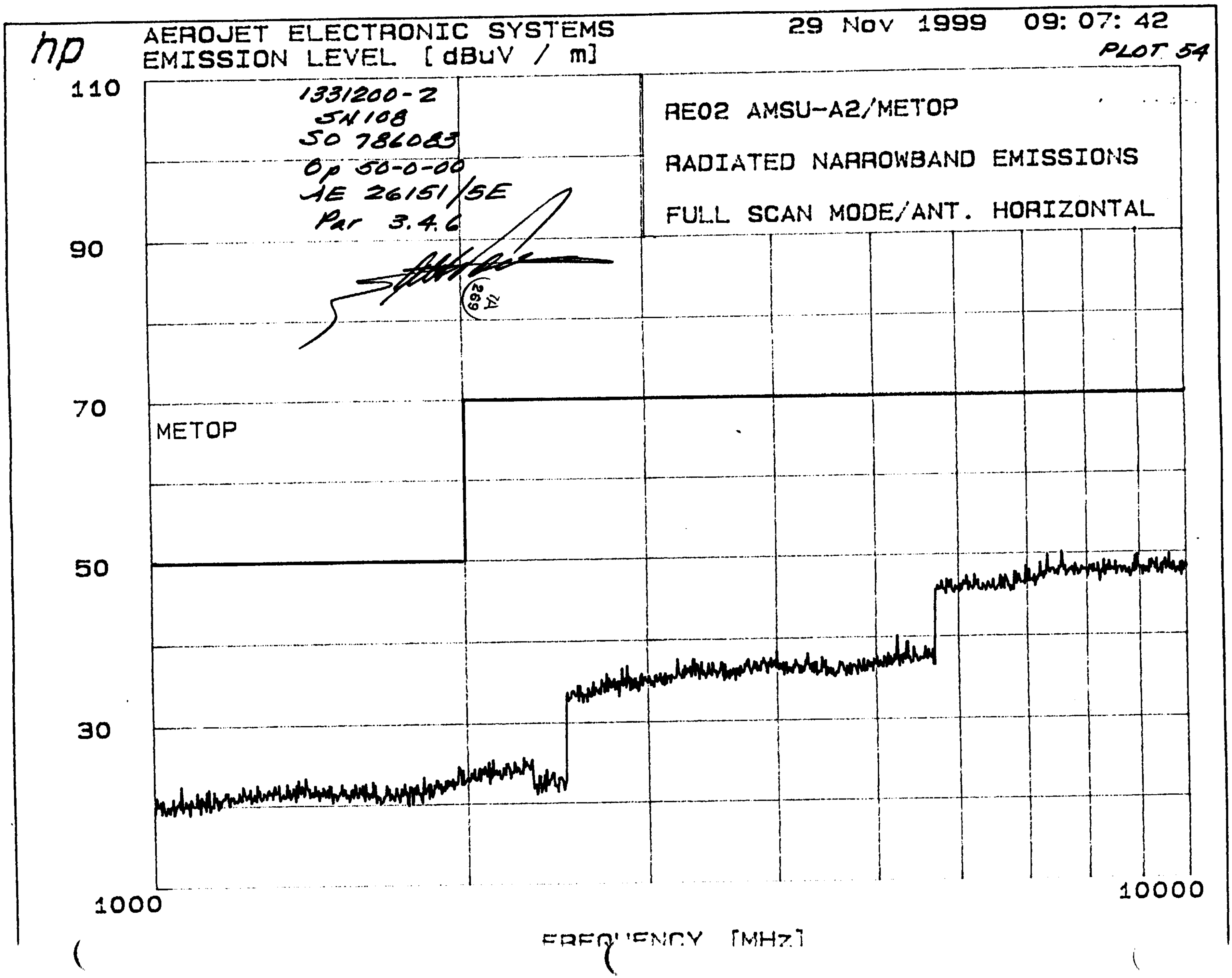


LOG CONICAL
REF -20.0 dBm
REO2 Special/Frequencies
ATTEN 10 dB
MKR 751.943 917 MHz
-94.20 dBm
hp
10 dB/
24 Nov 97
PLOT 51
AMSU-A2
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
CENTER
751.944 00 MHz
DL
-60.0
dBm
TA
269
CENTER 751.944 00 MHz
RES BW 3 kHz
VBW 10 kHz
SPAN 1.00 kHz
SWP 33.3 msec

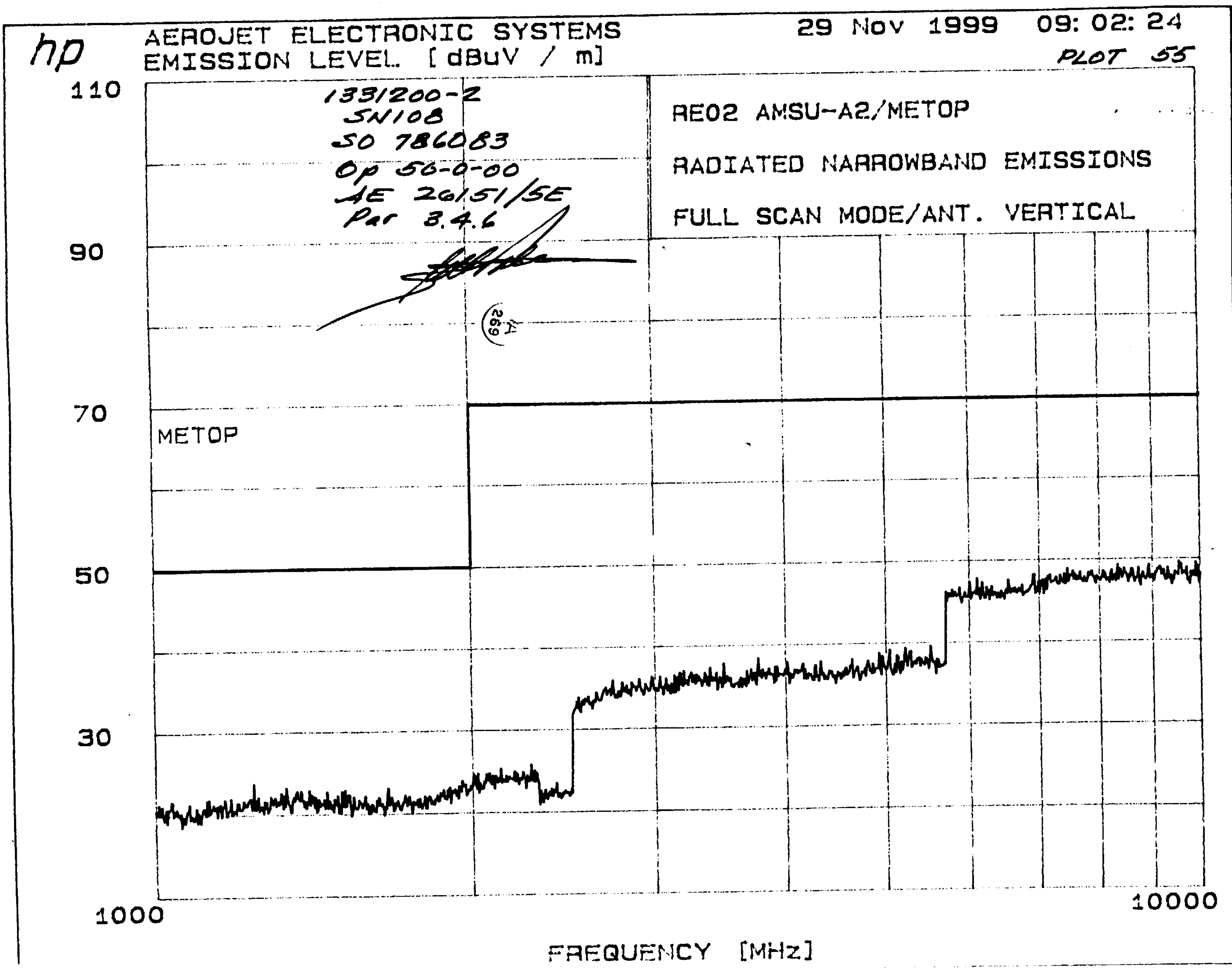


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
30 Nov 1999 09: 26: 05
PLOT 52
AMSU-A2 / METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. VERTICAL
AMSU-A2
1331200-2
SN 108
SO 786083
Op 60-0-00
AE 26151/5E
Par 3.4.6
7A
269
METOP
100
80
60
40
20
.014
.1
1
10
100
1000
FREQUENCY [MHz]

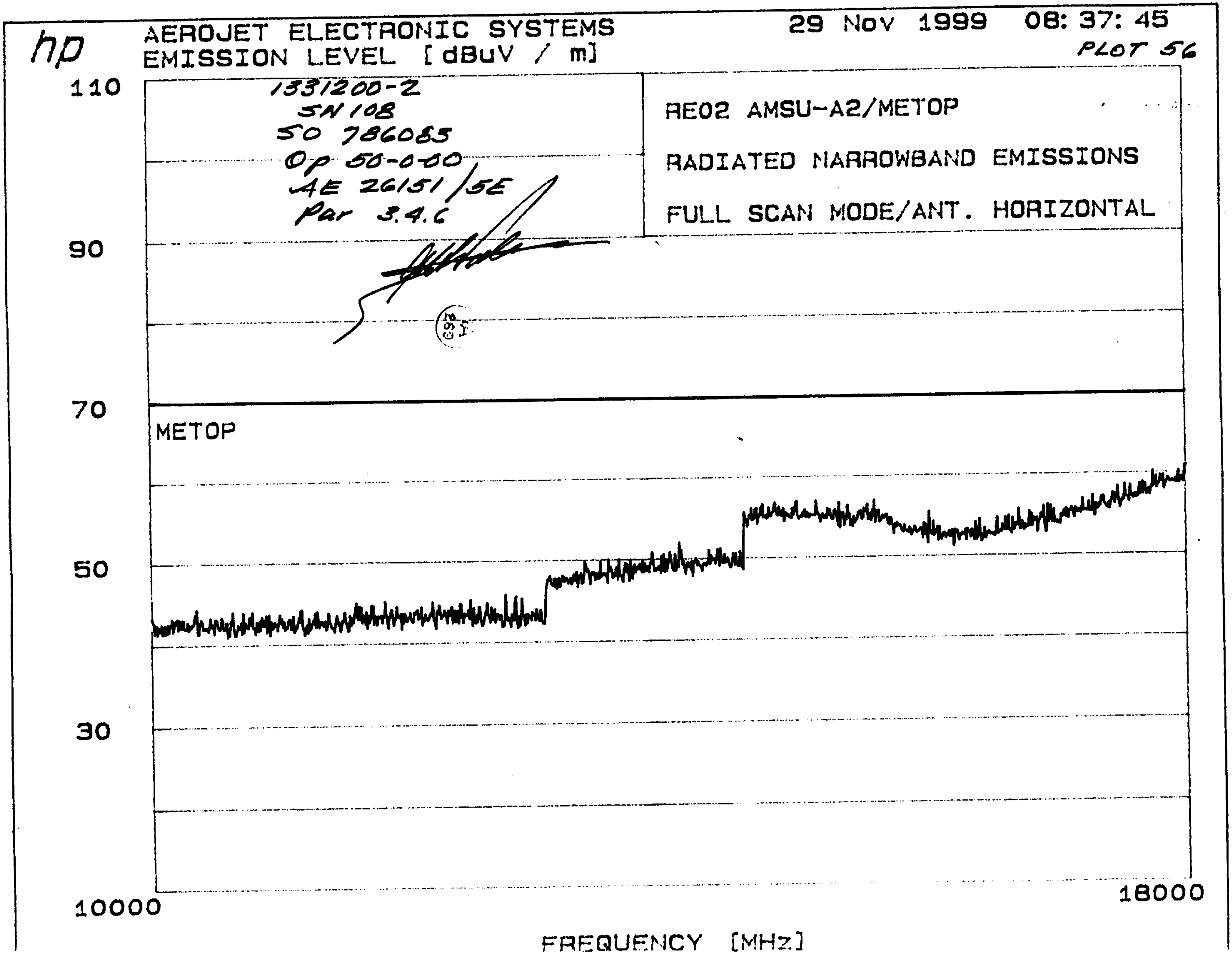

hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
29 Nov 1999 13:04:24
PLOT 53
AMSU-A2 / METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. VERTICAL
AMSU-A2
1331200-2
SN108
SO 786083
Op 50-0-00
AE 26151/5E
Par 3.4.6
7A
269
METOP
100
80
60
40
20
.014
.1
1
10
100
1000
FREQUENCY [MHz]

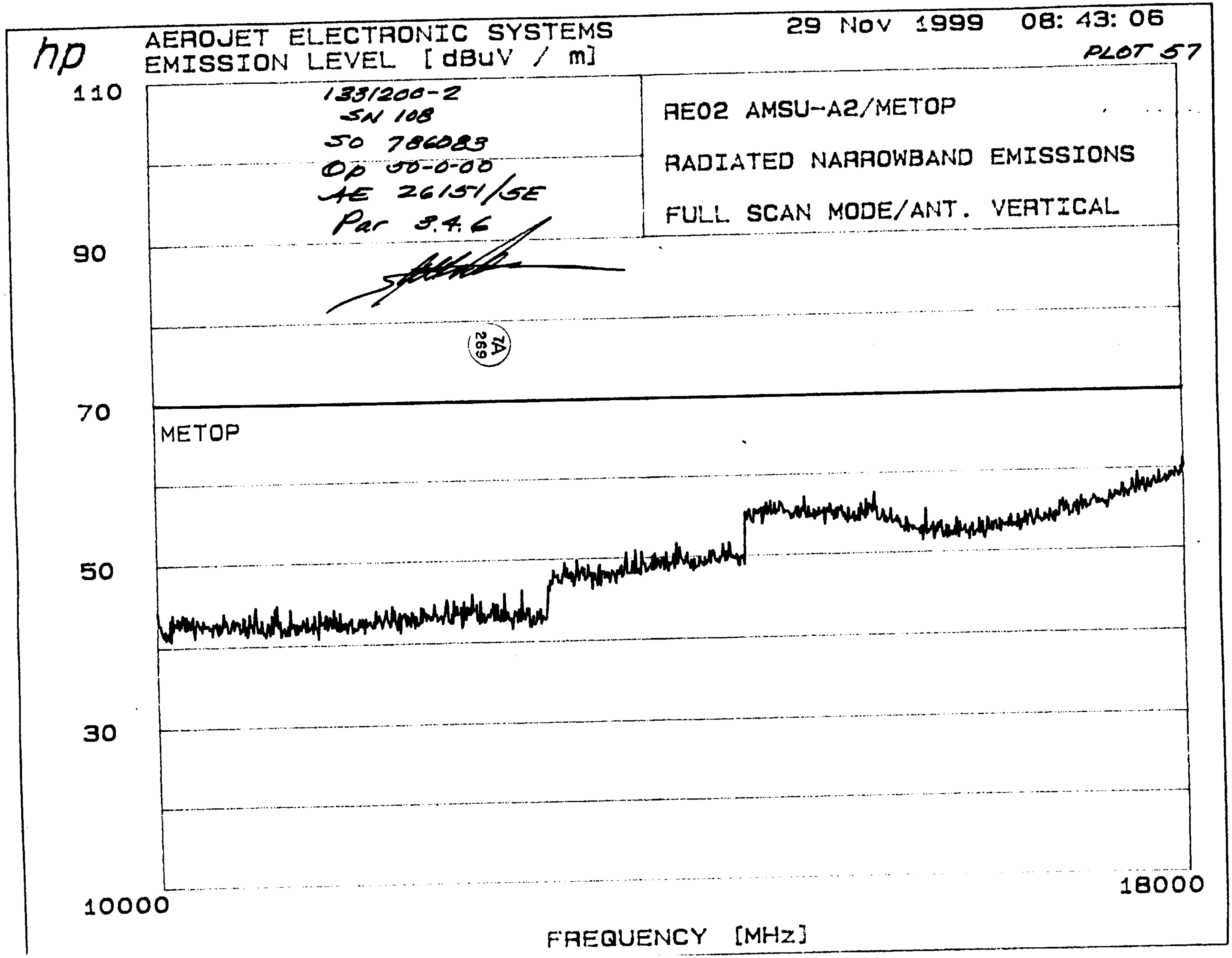


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
29 Nov 1999 09: 07: 42
PLOT 54
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
7A 269
RE02 AMSU-A2/METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. HORIZONTAL
110
90
70
50
30
METOP
1000
10000
FREQUENCY [MHz]



hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
29 Nov 1999 09: 02: 24
PLOT 55
133/200-2
SN108
SO 786083
Op 56-0-00
AE 26151/SE
Par 3.4.6
RE02 AMSU-A2/METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. VERTICAL
METOP
110
90
70
50
30
1000
10000
FREQUENCY [MHz]


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
29 Nov 1999 08: 37: 45
PLOT 56
1331200-2
SN 108
SO 786085
Op 50-0-00
AE 26151 /SE
Par 3.4.C
RE02 AMSU-A2/METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. HORIZONTAL
110
90
70
50
30
METOP
10000
18000
FREQUENCY [MHz]


hp
AEROJET ELECTRONIC SYSTEMS
EMISSION LEVEL [dBuV / m]
29 Nov 1999 08: 43: 06
PLOT 57
133/200-2
SN 108
SO 786083
Op 00-0-00
AE 26151/SE
Par 3.4.6
RE02 AMSU-A2/METOP
RADIATED NARROWBAND EMISSIONS
FULL SCAN MODE/ANT. VERTICAL
7A
269
METOP
110
90
70
50
30
10000
18000
FREQUENCY [MHz]

AEROJET ELECTRONIC SYSTEMS

30 Nov 99
1331200-2
SN 108
SO 786083
Op 50-0-00
AB 26151/6B

TEST SETUP TABLE	PG 1 OF 6

LIBRARY TEST FILE: SETUP NOT STORED

DISPLAY TITLE 1:	AMSU-A2 / METOP
CONTROL PARAMETERS	
Test Type	PEAK
Freq Uncert (%)	1
Min Sweep Time/Oct (sec)	3
NUMBER PAGES NOTES	0
NUMBER RANGES	4
START FREQUENCY (MHz)	.014

RNG	STOP FREQ(MHz)	TRANSDUCER
1	.2	EMCO 3301 - ACTIVE MONOPOLE
2	30.0	EMCO 3301 - ACTIVE MONOPOLE
3	200.0	EMCO 3110 - BICONICAL (1 meter)
4	1000.0	E-M LCA-25 - LOG SPIRAL @ 1m

DISPLAY INFORMATION	PG 2 OF 6

AMPLITUDE INFO

Units Label	dBuV / m
Disp Ref Level	100

TEST LIMITS

Number Limits	1
Limit 1	NARROWBAND

AEROJET ELECTRONIC SYSTEMS

30 Nov 99
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

===

RANGE 1: .014 TO .2 MHz

===

```
AMPLIFIER
  Name                  HP8447A-H64
  Gain (dB)                 28
INPUT PORT                 LEFT
MSMT STATES
  QP Bandwidth (Hz)      BYPASS
  SA Res Bandw (Hz)        300
  Video Bandw. (Hz)       3000
  Ref. Level (dBuV)        100
  Int. Atten. (dB)          10
  Ext. Atten. (dB)           0
NO. OF SETUPS                1
NO. SWEEPS/SETUP             1
FIRST SETUP
  Msg,Sub,Continue      MESSAGE
  Msg:    CONNECT EMCO 3301 & HP8447F - 28dB INPUT
```

===

RANGE 2: .2 TO 30.0 MHz

===

```
AMPLIFIER
  Name                  HP8447F-H64
  Gain (dB)                 28
INPUT PORT                 LEFT
MSMT STATES
  QP Bandwidth (Hz)      BYPASS
  SA Res Bandw (Hz)        3E3
  Video Bandw. (Hz)      30000
  Ref. Level (dBuV)        100
  Int. Atten. (dB)          10
  Ext. Atten. (dB)           0
NO. OF SETUPS                1
NO. SWEEPS/SETUP             1
FIRST SETUP
  Msg,Sub,Continue      CONTINUE
```

30 Nov 99
1381200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

===

RANGE 3: 30.0 TO 200.0 MHz   PG 5 OF 6

===

```
AMPLIFIER
  Name                 HP8447F - H64
  Gain (dB)                 25
INPUT PORT                 RIGHT
MSMT STATES
  QP Bandwidth (Hz)       BYPASS
  SA Res Bandw (Hz)        30E3
  Video Bandw. (Hz)        300E3
  Ref. Level (dBuV)        100
  Int. Atten. (dB)         10
  Ext. Atten. (dB)          0
NO. OF SETUPS               1
NO. SWEEPS/SETUP            1
FIRST SETUP
  Msg,Sub,Continue      MESSAGE
  Msg:   CONNECT BICON ANT & HP8447F 25 dB INPUT
```

===

RANGE 4: 200.0 TO 1000.0 MHz   PG 6 OF 6

===

```
AMPLIFIER
  Name                 HP8447F - H64
  Gain (dB)                 25
INPUT PORT                 RIGHT
MSMT STATES
  QP Bandwidth (Hz)       BYPASS
  SA Res Bandw (Hz)        30E3
  Video Bandw. (Hz)       300000
  Ref. Level (dBuV)         80
  Int. Atten. (dB)          10
  Ext. Atten. (dB)           0
NO. OF SETUPS                1
NO. SWEEPS/SETUP             1
FIRST SETUP
  Msg,Sub,Continue      MESSAGE
  Msg:   CONNECT LOG SPIRAL & HP8447D TO RIGHT IN
```

AEROJET ELECTRONIC SYSTEMS

30 Nov 99
1881200-2
SN 108
SO 786083
Op 60-0-00
AE 26151

==

TRANSDUCER TABLE

==

TRANSDUCER TITLE EMCO 3301 - ACTIVE MONOPOLE
SIGN OF TRANSDUCER PLUS
NUMBER OF POINTS 21

POINT	FREQUENCY(MHz)	TRANSDUCER FACTOR
1	.014	13.1
2	.020	12.4
3	.040	12.3
4	.060	12.1
5	.100	12.1
6	.150	11.8
7	.200	11.7
8	.400	11.4
9	.600	11.6
10	.850	11.2
11	1.000	11.3
12	1.600	10.4
13	2.000	10.9
14	4.000	10.4
15	6.000	10.6
16	8.000	10.1
17	10.000	9.7
18	15.000	10.2
19	20.000	11.9
20	25.000	12.3
21	30.000	12.7

AEROJET ELECTRONIC SYSTEMS

==
TRANSDUCER TABLE
==

30 Nov 99
1331200-2
SN 108
SO 786083
Op 50-0-0
AE 26151/6

TRANSDUCER TITLE EMCO 3110 - BICONICAL (1 meter)
SIGN OF TRANSDUCER PLUS
NUMBER OF POINTS 28

POINT	FREQUENCY(MHz)	TRANSDUCER FACTOR
1	30	12.7
2	40	11.4
3	50	10.6
4	60	11.0
5	70	10.9
6	80	10.2
7	90	10.2
8	100	10.7
9	110	11.8
10	120	13.3
11	130	13.6
12	140	13.4
13	150	13.2
14	160	13.3
15	170	15.0
16	180	16.2
17	190	15.6
18	200	15.9
19	210	15.9
20	220	16.5
21	230	18.3
22	240	19.8
23	250	19.9
24	260	19.1
25	270	19.3
26	280	20.8
27	290	23.0
28	300	24.7

AEROJET ELECTRONIC SYSTEMS

TRANSDUCER TABLE

30 Nov 99
1381200-2
SN 108
SO 786083
Op 50-0-00
AE 2615/15.

TRANSDUCER TITLE E-M LCA-25 - LOG SPIRAL @ 1m
SIGN OF TRANSDUCER PLUS
NUMBER OF POINTS 33

POINT	FREQUENCY(MHz)	TRANSDUCER FACTOR
1	200	23.3
2	225	23.0
3	250	21.7
4	275	19.4
5	300	17.8
6	325	17.5
7	350	17.0
8	375	17.5
9	400	17.9
10	425	18.2
11	450	18.6
12	475	19.1
13	500	19.8
14	525	20.1
15	550	20.3
16	575	20.8
17	600	21.2
18	625	21.5
19	650	21.9
20	675	22.3
21	700	22.7
22	725	22.8
23	750	23.3
24	775	22.7
25	800	24.3
26	825	24.9
27	850	25.5
28	875	25.7
29	900	26.2
30	925	26.4
31	950	26.6
32	975	26.6
33	1000	26.8

AEROJET ELECTRONIC SYSTEMS

===

LIMIT TABLE

===

LIMIT TITLE NARROWBAND
NUMBER OF POINTS 2

POINT	FREQUENCY(MHz)	AMPLITUDE
1	.010	50
2	1000.000	50

30Nov99
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 261511

AEROJET ELECTRONIC SYSTEMS

29 Nov 99
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

```
=================================================
TEST SETUP TABLE                         PG 1 OF 5
=================================================
LIBRARY TEST FILE: SETUP NOT STORED

DISPLAY TITLE 1:          RE02 AMSU-A2/METOP
CONTROL PARAMETERS
  Test Type                     PEAK
  Freq Uncert (%)               .5
  Min Sweep Time/Oct (sec)      3
NUMBER PAGES NOTES              0
NUMBER RANGES                   3
START FREQUENCY (MHz)           1000

RNG STOP FREQ(MHz)             TRANSDUCER
=== ============= ===============================
 1        2500        RGA 180  HORN ANTENNA
 2        5700        RGA 180  HORN ANTENNA
 3       10000        RGA 180  HORN ANTENNA


=================================================
DISPLAY INFORMATION                      PG 2 OF 5
=================================================

AMPLITUDE INFO
  Units Label        dBuV / m
  Disp Ref Level       110

TEST LIMITS
  Number Limits         1
  Limit 1             METOP
```

AEROJET ELECTRONIC SYSTEMS

RANGE 1: 1000 TO 2500 MHz	PG 3 OF 5
AMPLIFIER	
Name	HP8449B
Gain (dB)	30
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	10E3
Video Bandw. (Hz)	100000
Ref. Level (dBuV)	80
Int. Atten. (dB)	10
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	MESSAGE

Msg: CONNECT DBL RIDGE ANT TO AMPL INPUT

29 Nov 99
1331200-Z
SN 108
SO 786083
Op 50-0-00
AE 26151/5E

263

RANGE 2: 2500 TO 5700 MHz	PG 4 OF 5
AMPLIFIER	
Name	HP8449B
Gain (dB)	30
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	100E3
Video Bandw. (Hz)	1.E+6
Ref. Level (dBuV)	80
Int. Atten. (dB)	10
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

AEROJET ELECTRONIC SYSTEMS

AMPLIFIER	
Name	HP 8448B
Gain (dB)	30
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	300E3
Video Bandw. (Hz)	3.E+6
Ref. Level (dBuV)	80
Int. Atten. (dB)	10
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

29 Nov 99
133/200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5E

AEROJET ELECTRONIC SYSTEMS

29 Nov 99
1331200-2
SN 108
50786083
Op 50-0-00
4E26151/SE

TEST SETUP TABLE	PG 1 OF 6

LIBRARY TEST FILE: SETUP NOT STORED

DISPLAY TITLE 1:	AMSU-A METOP
CONTROL PARAMETERS	
Test Type	PEAK
Freq Uncert (%)	.5
Min Sweep Time/Oct (sec)	3
NUMBER PAGES NOTES	0
NUMBER RANGES	4
START FREQUENCY (MHz)	10000

RNG	STOP FREQ(MHz)	TRANSDUCER
1	12000	RGA 180 HORN ANTENNA
2	14000	RGA 180 HORN ANTENNA
3	16000	RGA 180 HORN ANTENNA
4	18000	RGA 180 HORN ANTENNA

DISPLAY INFORMATION	PG 2 OF 6

AMPLITUDE INFO	
Units Label	dBuV / m
Disp Ref Level	110
TEST LIMITS	
Number Limits	1
Limit 1	METOP

AEROJET ELECTRONIC SYSTEMS

29 Nov 99
1331200-2
SN 108
50786083
Op 50-0-00
AE 26151/5

==
RANGE 1: 10000 TO 12000 MHz   PG 3 OF 6
==

AMPLIFIER	
Name	
Gain (dB)	0
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	30E3
Video Bandw. (Hz)	300000
Ref. Level (dBuV)	80
Int. Atten. (dB)	0
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	MESSAGE

Msg: CONNECT HORN ANTENNA TO INPUT

==
RANGE 2: 12000 TO 14000 MHz   PG 4 OF 6
==

AMPLIFIER	
Name	
Gain (dB)	0
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	30E3
Video Bandw. (Hz)	300000
Ref. Level (dBuV)	80
Int. Atten. (dB)	0
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

AEROJET ELECTRONIC SYSTEMS

29 Nov 99
133/200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/5

RANGE 3: 14000 TO 16000 MHz	PG 5 OF 6
AMPLIFIER	
Name	
Gain (dB)	0
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	10E3
Video Bandw. (Hz)	100000
Ref. Level (dBuV)	80
Int. Atten. (dB)	0
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

RANGE 4: 16000 TO 18000 MHz	PG 6 OF 6
AMPLIFIER	
Name	
Gain (dB)	0
INPUT PORT	RIGHT
MSMT STATES	
QP Bandwidth (Hz)	BYPASS
SA Res Bandw (Hz)	10E3
Video Bandw. (Hz)	100000
Ref. Level (dBuV)	80
Int. Atten. (dB)	0
Ext. Atten. (dB)	0
NO. OF SETUPS	1
NO. SWEEPS/SETUP	1
FIRST SETUP	
Msg,Sub,Continue	CONTINUE

AEROJET ELECTRONIC SYSTEMS

29 Nov 99
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/3

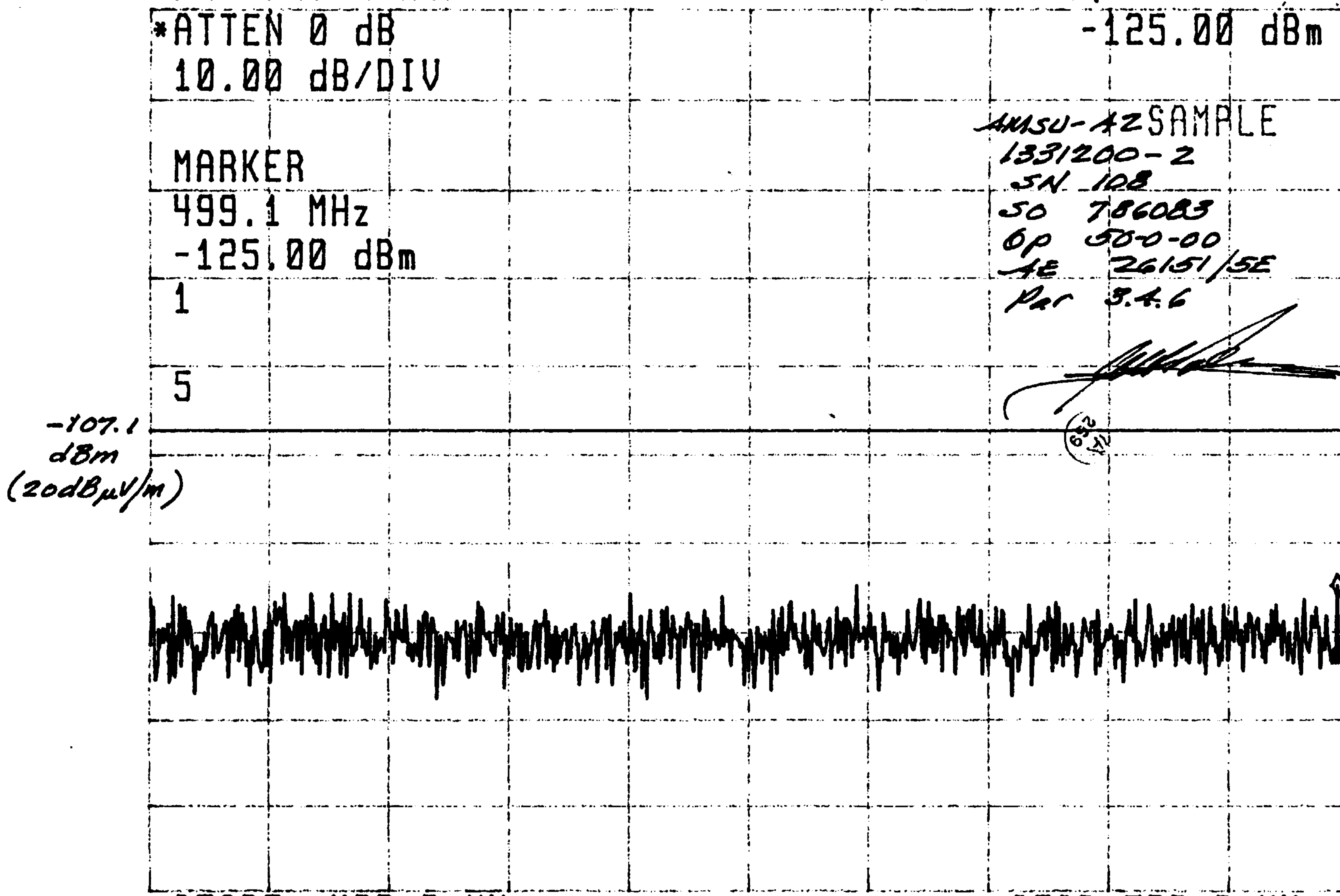
TRANSDUCER TABLE

TRANSDUCER TITLE RGA 180 HORN ANTENNA
SIGN OF TRANSDUCER PLUS
NUMBER OF POINTS 35

POINT	FREQUENCY(MHz)	TRANSDUCER FACTOR
1	1000	24.6
2	1500	24.9
3	2000	27.5
4	2500	29.2
5	3000	30.9
6	3500	33.1
7	4000	32.9
8	4500	32.4
9	5000	33.8
10	5500	35.1
11	6000	35.9
12	6500	35.7
13	7000	36.3
14	7500	37.3
15	8000	36.6
16	8500	37.9
17	9000	38.8
18	9500	38.6
19	10000	38.2
20	10500	38.4
21	11000	38.9
22	11500	39.2
23	12000	39.4
24	12500	39.3
25	13000	40.5
26	13500	42.3
27	14000	41.5
28	14500	41.3
29	15000	39.8
30	15500	38.1
31	16000	38.4
32	16500	40.4
33	17000	41.9
34	17500	42.5
35	18000	45.4

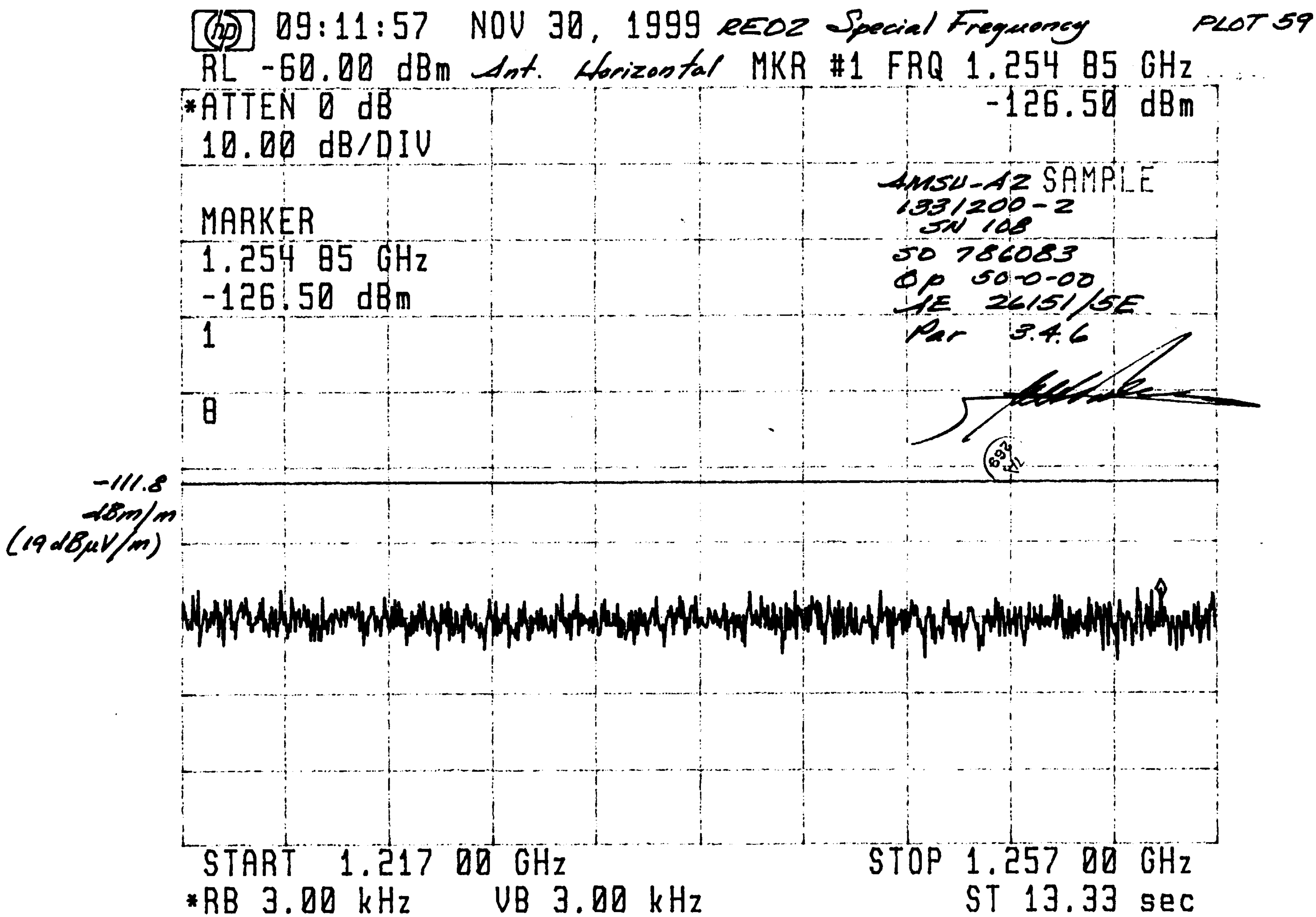
08:58:25 NOV 30, 1999 RE02 Special Frequency PLOT 58

RL -60.00 dBm MKR #1 FRQ 499.1 MHz

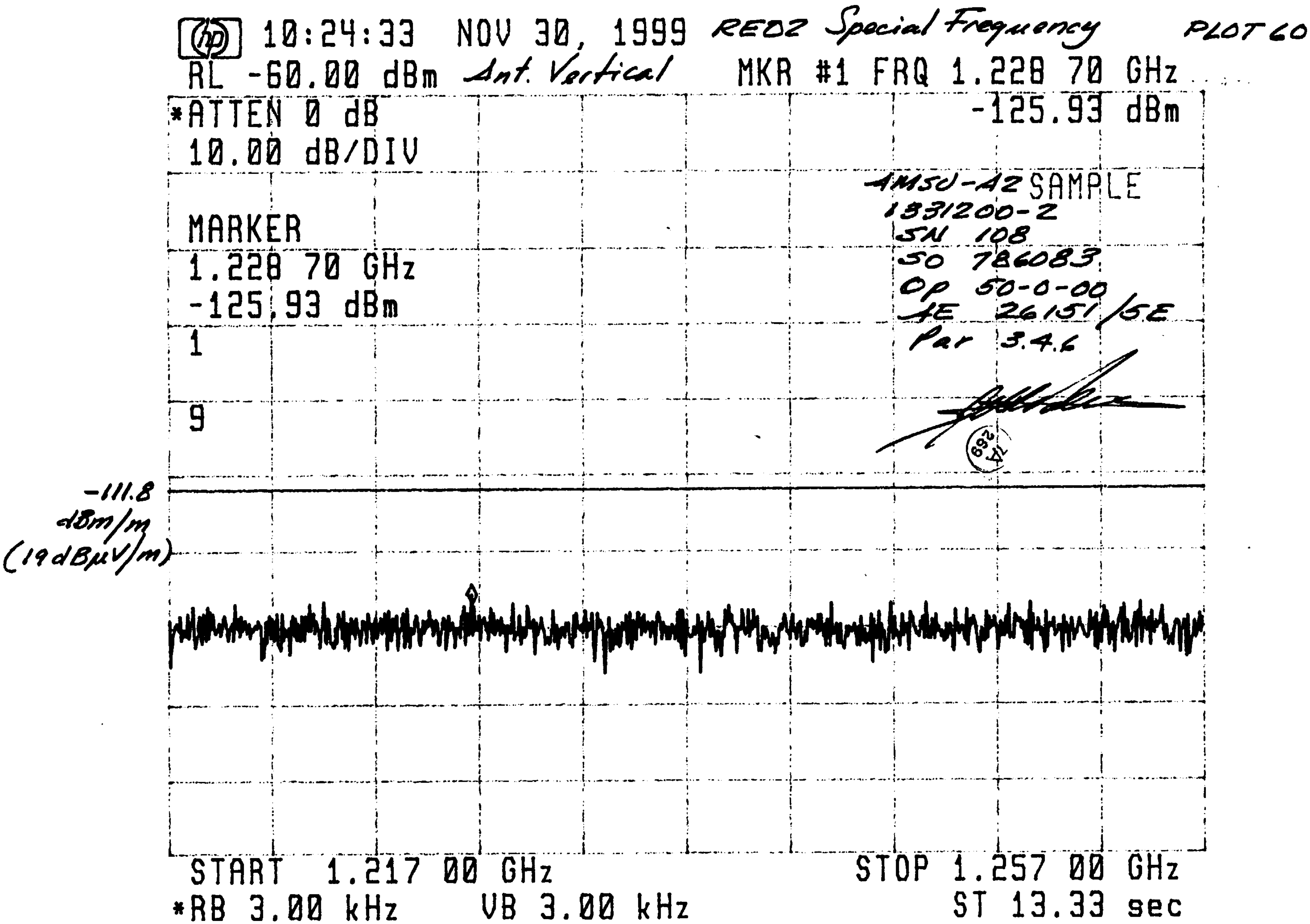


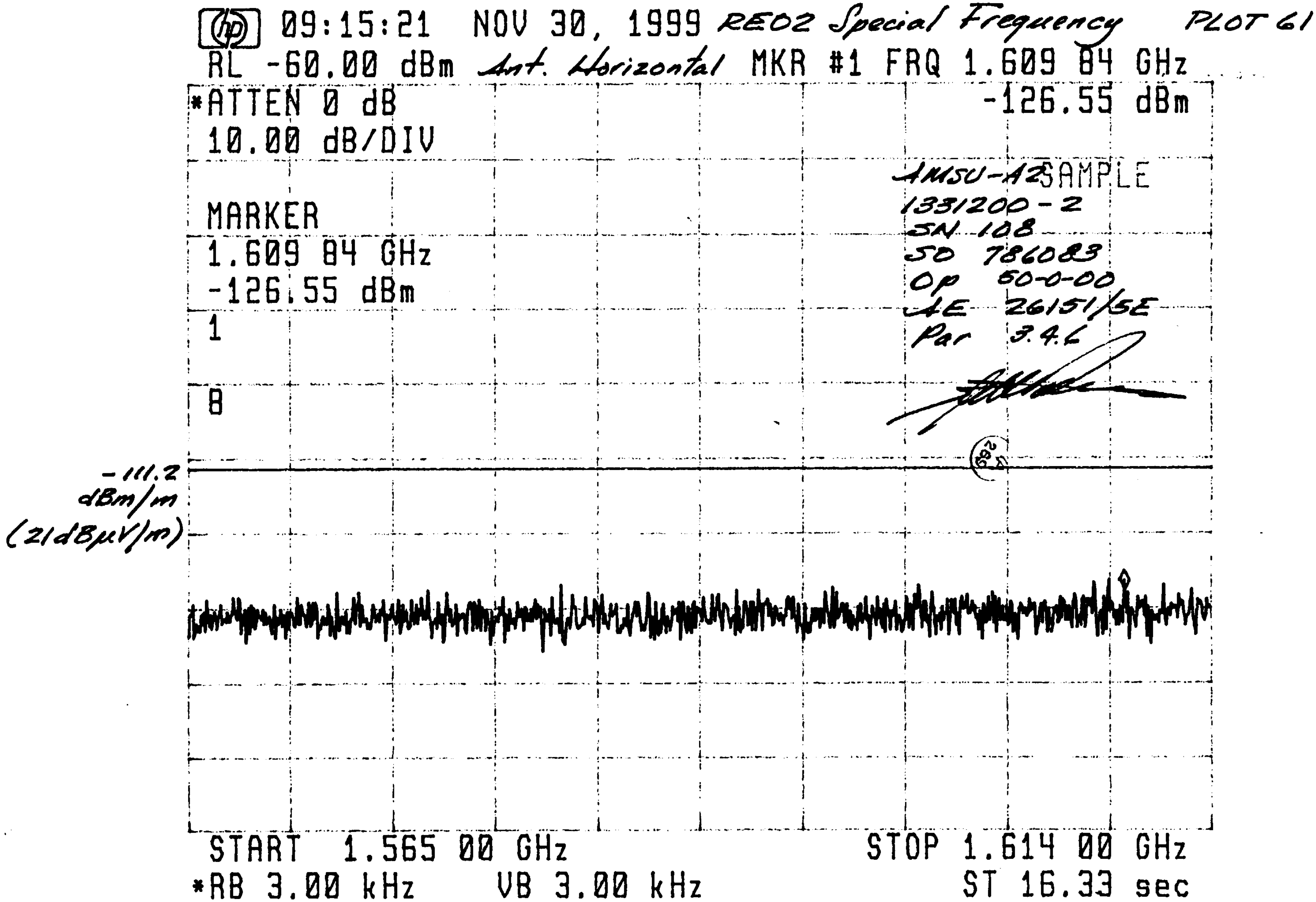
START 400.0 MHz STOP 500.0 MHz

*RB 3.00 kHz VB 3.00 kHz ST 33.33 sec

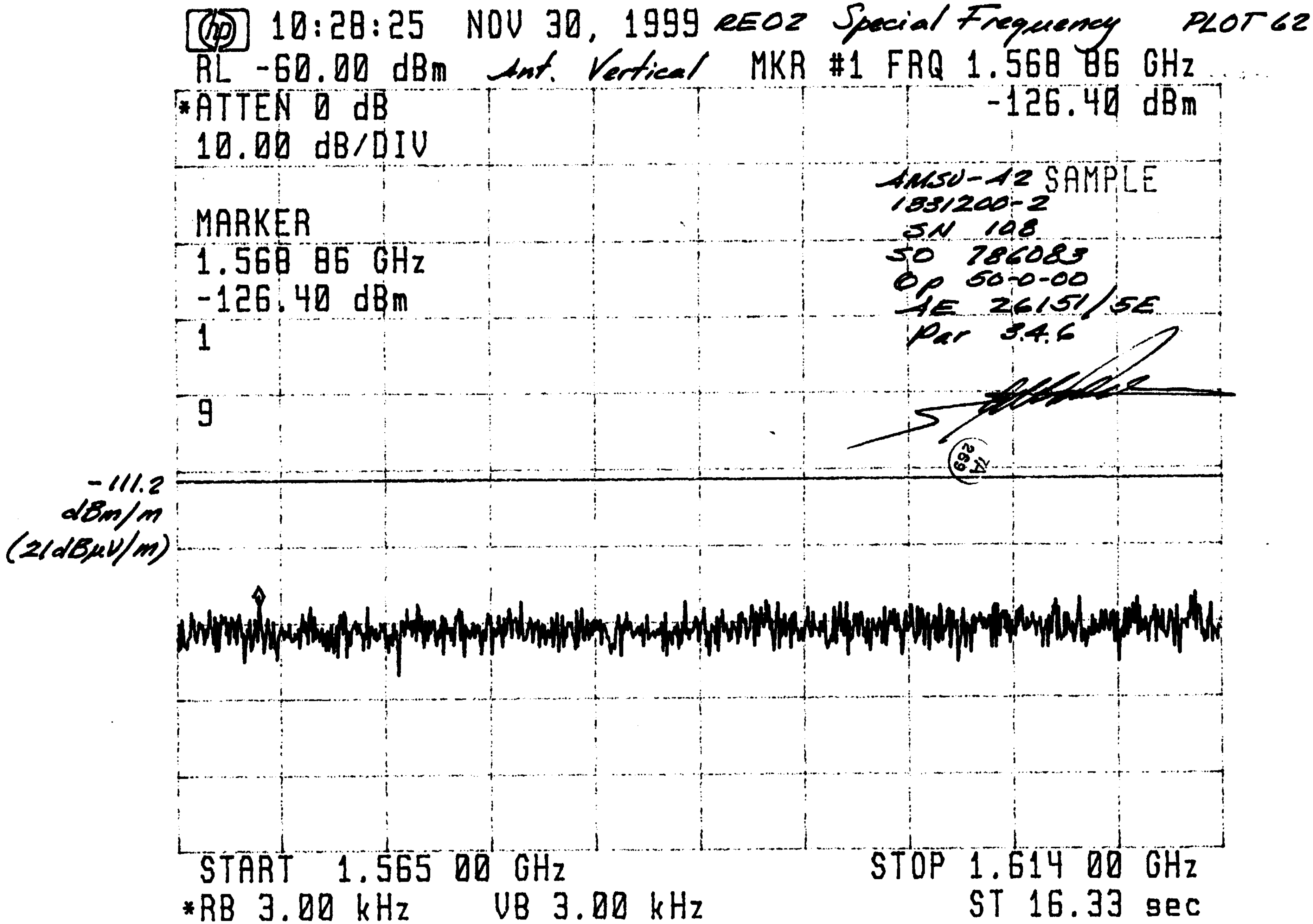


09:11:57 NOV 30, 1999 RE02 Special Frequency
PLOT 59
RL -60.00 dBm Ant. Horizontal MKR #1 FRQ 1.254 85 GHz
-126.50 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
1.254 85 GHz
-126.50 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
-111.8
dBm/m
(19 dBμV/m)
START 1.217 00 GHz
STOP 1.257 00 GHz
*RB 3.00 kHz
VB 3.00 kHz
ST 13.33 sec

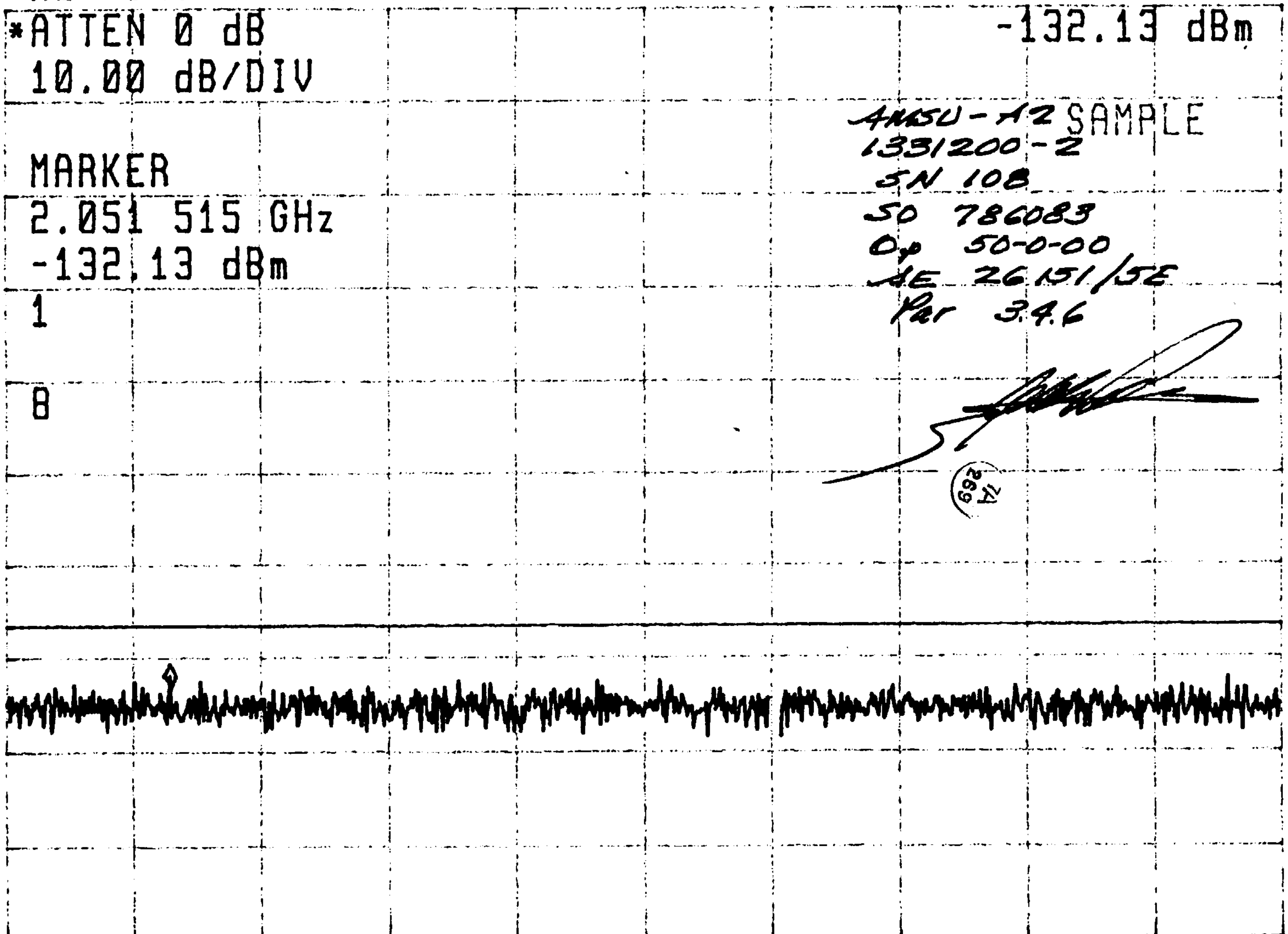

10:24:33 NOV 30, 1999 REDZ Special Frequency PLOT 60
RL -60.00 dBm Ant. Vertical MKR #1 FRQ 1.228 70 GHz
-125.93 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
1.228 70 GHz
-125.93 dBm
1
9
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
OP 50-0-00
AE 26151/SE
Par 3.4.6
7A
269
-111.8
dBm/m
(19 dBμV/m)
START 1.217 00 GHz
*RB 3.00 kHz
VB 3.00 kHz
STOP 1.257 00 GHz
ST 13.33 sec



09:15:21 NOV 30, 1999 RE02 Special Frequency
PLOT 61
RL -60.00 dBm Ant. Horizontal MKR #1 FRQ 1.609 84 GHz
-126.55 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
1.609 84 GHz
-126.55 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
-111.2 dBm/m
(21 dBμV/m)
START 1.565 00 GHz
STOP 1.614 00 GHz
*RB 3.00 kHz
VB 3.00 kHz
ST 16.33 sec


10:28:25 NOV 30, 1999 RE02 Special Frequency PLOT 62
RL -60.00 dBm Ant. Vertical MKR #1 FRQ 1.568 86 GHz
-126.40 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
1.568 86 GHz
-126.40 dBm
1
9
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
7A 269
-111.2 dBm/m (21dBµV/m)
START 1.565 00 GHz
STOP 1.614 00 GHz
*RB 3.00 kHz VB 3.00 kHz
ST 16.33 sec

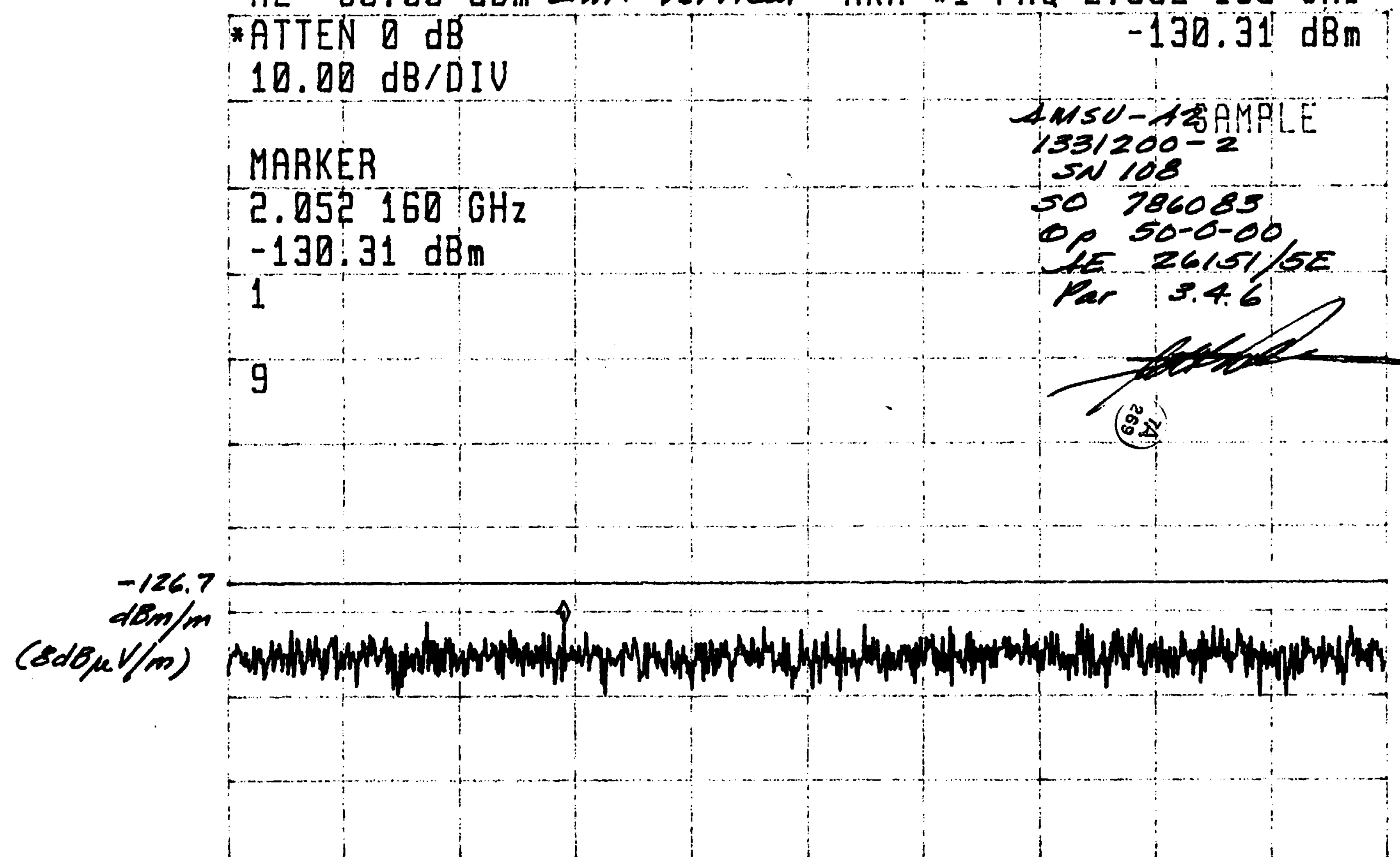
10:11:07 NOV 30, 1999 RE02 Special Frequency PLOT 63
RL -60.00 dBm Ant. Horizontal/ MKR #1 FRQ 2.051 515 GHz



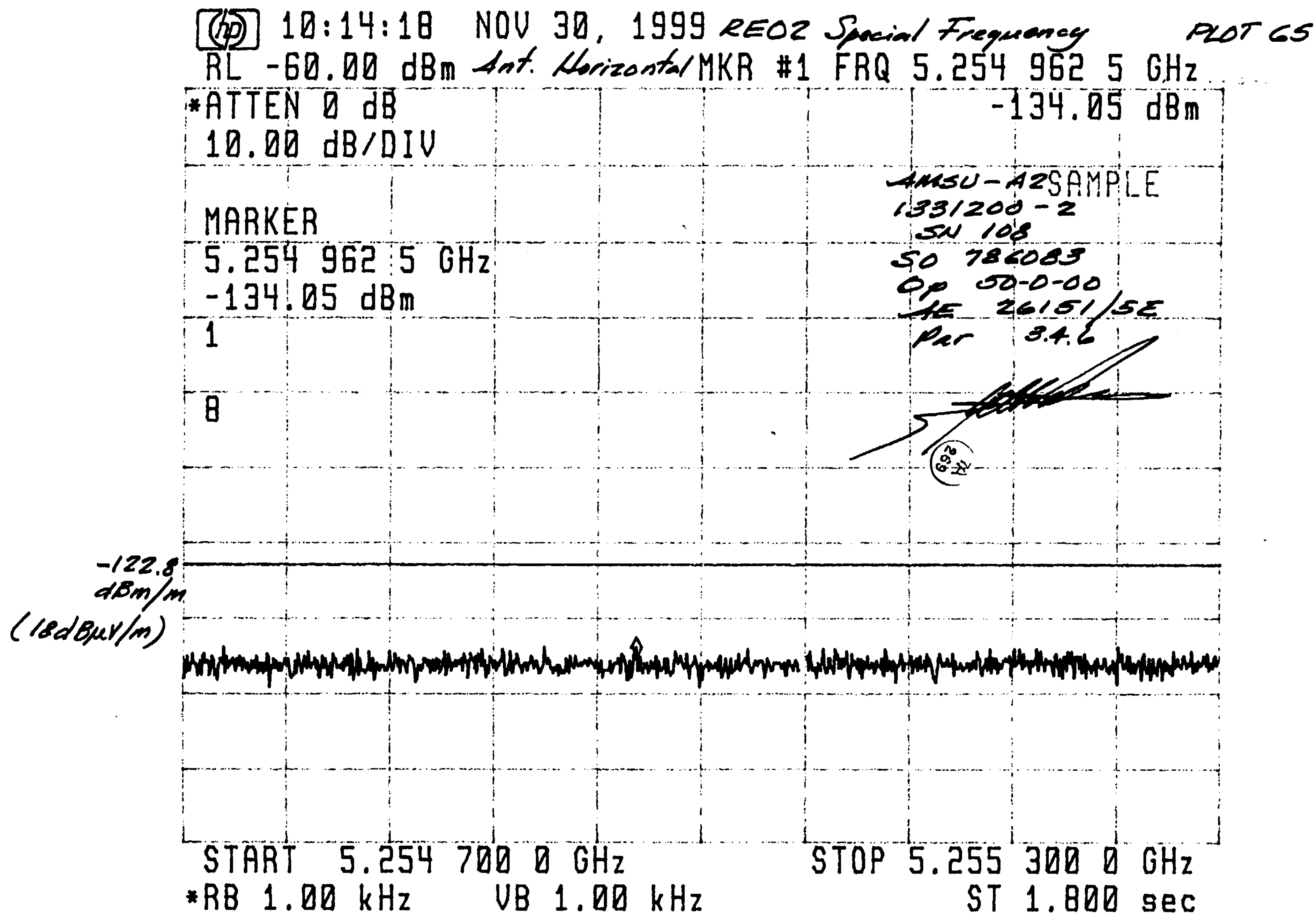
-126.7 dBm/m (8dBμV/m)

START 2.051 000 GHz STOP 2.055 000 GHz
*RB 1.00 kHz VB 1.00 kHz ST 12.00 sec

10:35:27 NOV 30, 1999 RE02 Special Frequency PLOT 64
RL -60.00 dBm Int. Vertical MKR #1 FRQ 2.052 160 GHz

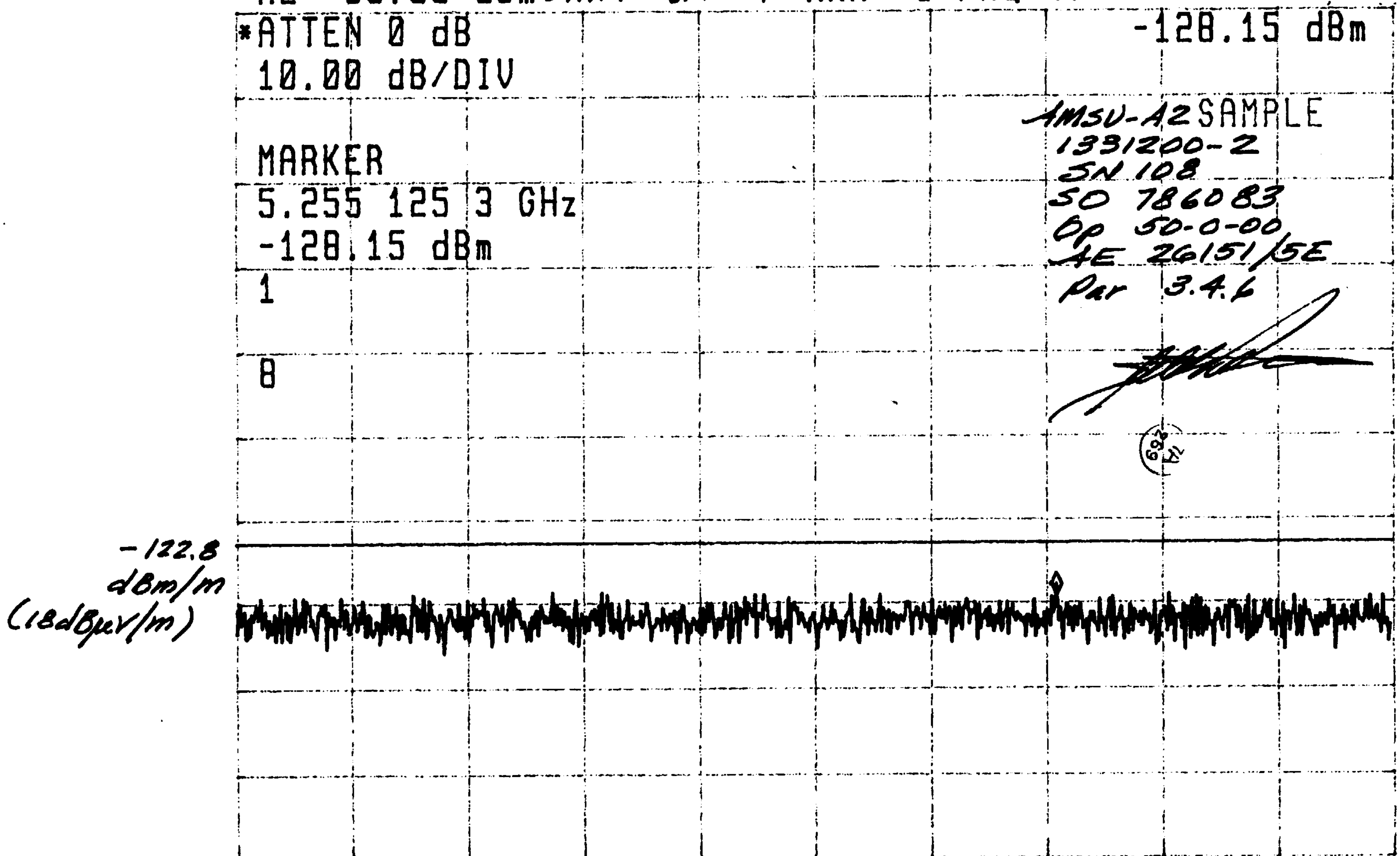


START 2.051 000 GHz STOP 2.055 000 GHz
*RB 1.00 kHz VB 1.00 kHz ST 12.00 sec



10:14:18 NOV 30, 1999 RE02 Special Frequency
PLOT 65
RL -60.00 dBm Ant. Horizontal MKR #1 FRQ 5.254 962 5 GHz
-134.05 dBm
*ATTEN 0 dB
10.00 dB/DIV
MARKER
5.254 962 5 GHz
-134.05 dBm
1
8
AMSU-A2 SAMPLE
1331200-2
SN 108
SO 786083
Op 50-0-00
AE 26151/SE
Par 3.4.6
269
-122.8 dBm/m
(18dBμV/m)
START 5.254 700 0 GHz
STOP 5.255 300 0 GHz
*RB 1.00 kHz
VB 1.00 kHz
ST 1.800 sec

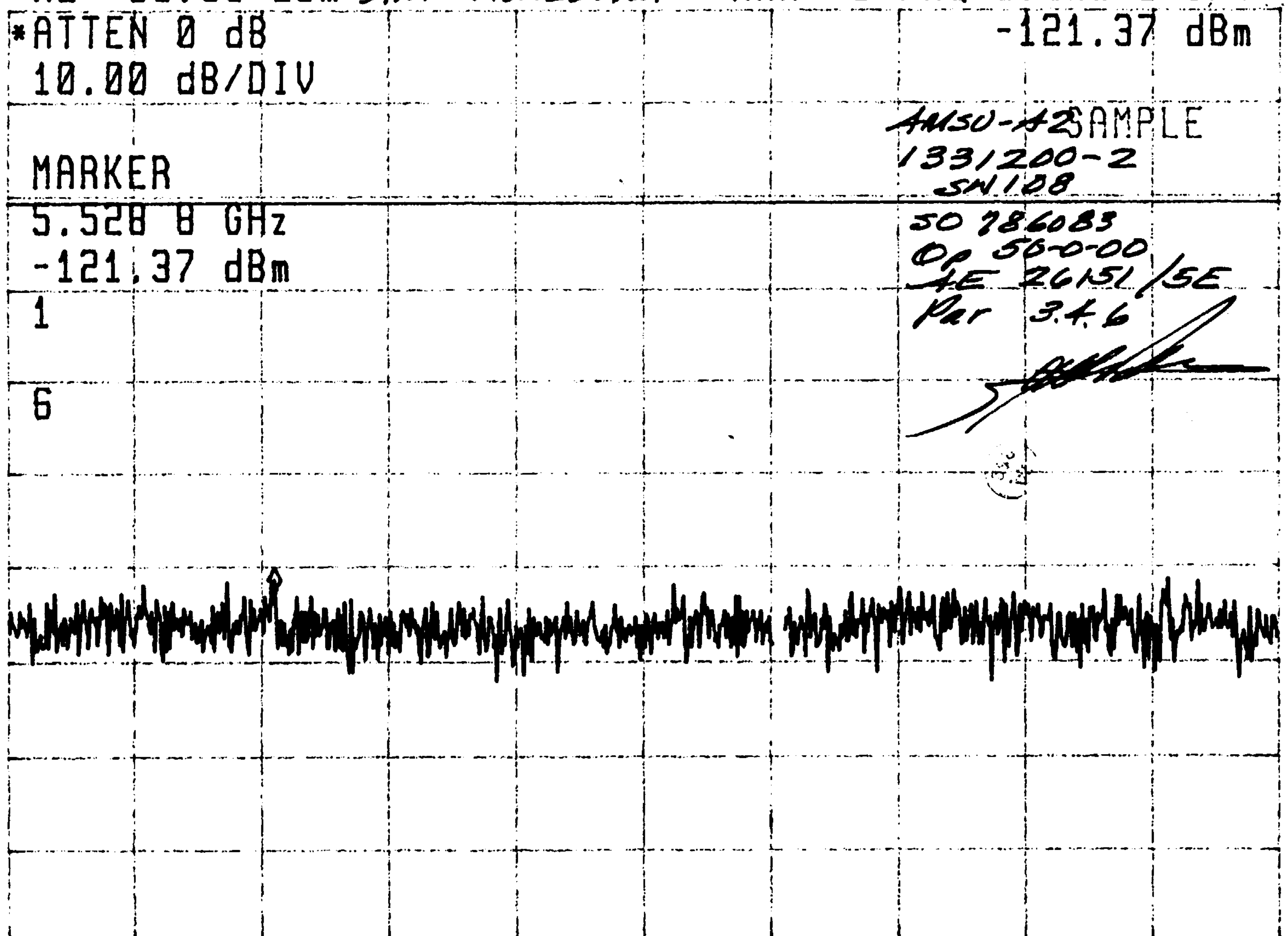
10:43:46 NOV 30, 1999 REO2 Special Frequency PLOT 66
RL -60.00 dBm Ant. Vertical MKR #1 FRQ 5.255 125 3 GHz



START 5.254 700 0 GHz STOP 5.255 300 0 GHz
*RB 3.00 kHz VB 3.00 kHz *ST 33.53 sec

10:18:21 NOV 30, 1999 RE02 Special Frequency PLOT 67

RL -60.00 dBm Ant. Horizontal MKR #1 FRQ 5.528 8 GHz



-80.7 dBm/m (61 dBμV/m)

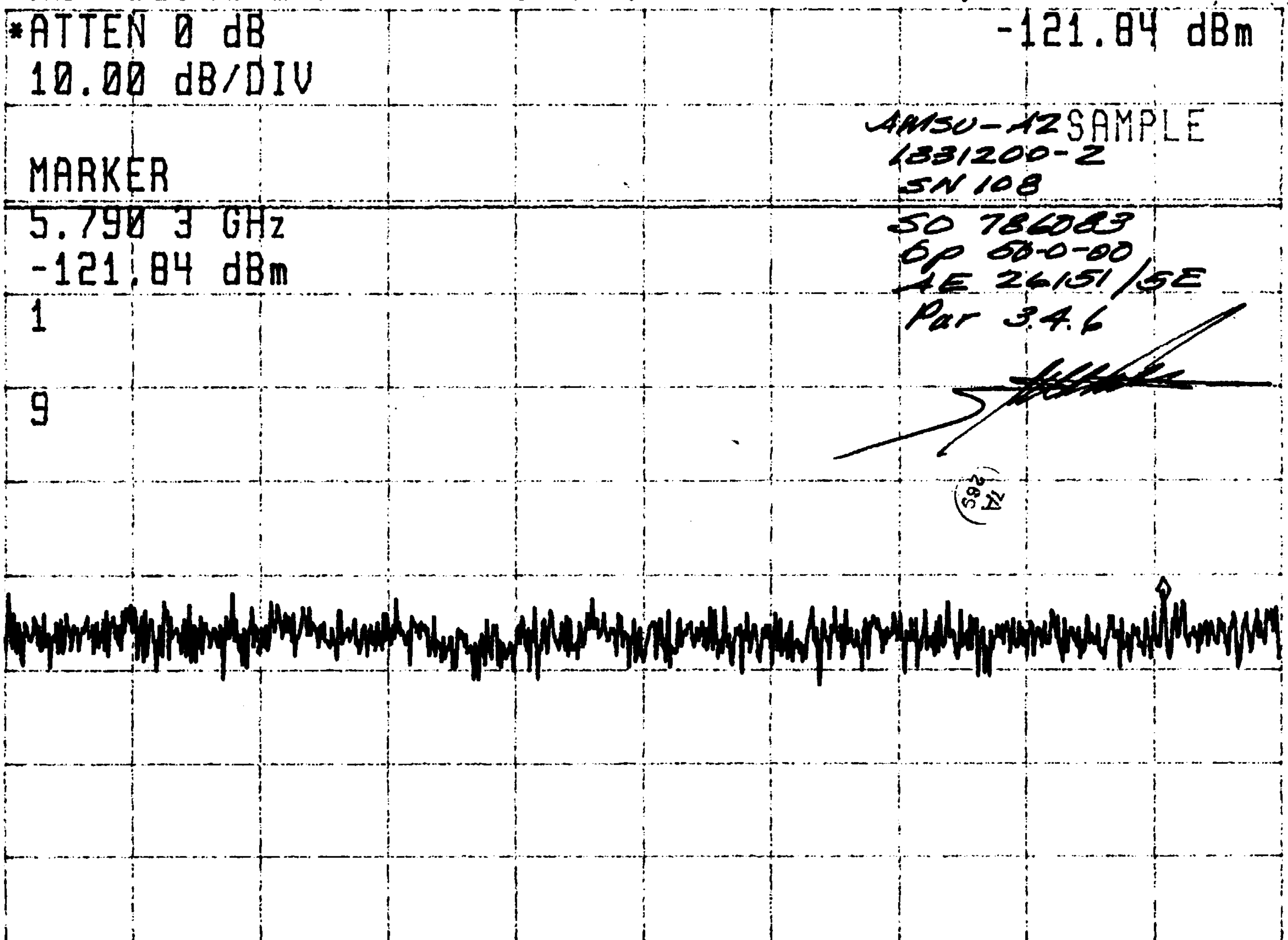
START 5.450 0 GHz STOP 5.825 0 GHz

*RB 10.0 kHz VB 10.0 kHz ST 11.25 sec

hp 10:48:20 NOV 30, 1999 RE02 Special Frequency PLOT 68

RL -60.00 dBm Ant. Vertical MKR #1 FRQ 5.790 3 GHz

- 80.7
dBm/m
(61 dBµV/m)



START 5.450 0 GHz STOP 5.825 0 GHz
*RB 10.0 kHz VB 10.0 kHz *ST 23.13 sec

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Report Documentation Page

1. Report No. ---	2. Government Accession No. ---	3. Recipient's Catalog No. ---
4. Title and Subtitle: Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report		5. Report Date: March 2000
		6. Performing Organization Code: ---
7. Author(s): J. Linn		8. Performing Organization Report No.: 11658
		10. Work Unit No.: ---
9. Performing Organization Name and Address: Aerojet, 1100 W. Hollyvale, Azusa, CA 91702		11. Contract or Grant No.: NAS 5-32314
		13. Type of Report and Period Covered: Final
12. Sponsoring Agency Name and Address: NASA, Goddard Space Flight Center, Greenbelt, Maryland 20771		14. Sponsoring Agency Code: ---
15. Supplementary Notes: ---		

16. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, Final Comprehensive Performance Test Report, P/N 1331200-2-TST, S/N 108/A2, for the Integrated Advanced Microwave Sounding Unit-A
(AMSU-A).

17. Key Words (Suggested by Author(s)): EOS, Microwave System	18. Distribution Statement: Unclassified --- Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of pages	22. Price
Unclassified	Unclassified		---

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4. TITLE AND SUBTITLE Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report	5. FUNDING NUMBERS NAS 5-32314
6. AUTHOR(S) J. Linn	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Aerojet 1100 W. Hollyvale Azusa, CA 91702	8. PERFORMING ORGANIZATION REPORT NUMBER 11658 March 2000
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) NASA Goddard Space Flight Center Greenbelt, Maryland 20771	10. SPONSORING/MONITORING AGENCY REPORT NUMBER ---

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
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13. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, Final Comprehensive Performance Test Report, P/N 1331200-2-ITST S/N 108/A2, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

14. SUBJECT TERMS	15. NUMBER OF PAGES
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